

**UG Programme available at the Institute as per NEP - 2020  
FOUR-YEARS (Eight Semester Degree Course)  
Bachelor of Science (Hons & Research) - B.Sc.**

A student admitted to this program is required to undergo and successfully complete the following types of courses:

**Table 1: Types of Courses and Choice for Selection**

<b>S.No</b>	<b>Course Type</b>	<b>Choice for Selection</b>
1	Major (Core) Subject and Minor Subject	Students will have to choose any two subjects from the subjects mentioned in Table 3 at the time of admission. Out of these two subjects, the student will have to declare a choice of Major and Minor subject at the beginning of Semester III. Students will have to choose only one subject as a Major subject and only one subject as a Minor subject which obviously will be other than the Major subject she/he has chosen. The major subject comprises Mandatory and Elective Courses. Once the Minor subject is chosen, a student must pursue all the courses from the basket of that Minor only. Change of major or minor subject shall not be permitted after the examination form is submitted.
2	Open Elective Course (OE)	A student is required to select an 'OPEN ELECTIVE' from the 'Open Elective Basket' offered by the Institute of Science, Nagpur before filling out 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. A student is allowed to earn credits for 'OPEN ELECTIVE' by successfully completing courses of equivalent credits from the Cluster of Colleges identified by the Institute of Science, Nagpur. A student is also allowed to earn credits for 'OPEN ELECTIVE' by successfully completing online courses of equivalent credits from SWAYAM/NPTEL learning platforms or other Higher Education Institutions affiliated with RTM Nagpur University. However, this needs to be informed by the student to the Institute before the commencement of the semester and an application for transfer of credits is required to be made by the student.
3	Vocational Skill Course (VSC)	A student is required to successfully complete the 'VOCATIONAL SKILL COURSE' from the Basket offered by the Institute of Science, Nagpur for this purpose. This course must be a course corresponding to the 'MAJOR' and/or MINOR subject selected by a student. A student is allowed to earn credits for a 'VOCATIONAL SKILL COURSE' by successfully completing online courses of equivalent credits from SWAYAM/NPTEL learning platforms or other Higher Education Institutions affiliated to RTM Nagpur University provided they are approved by the competent authority of the Institute of Science, Nagpur. However, this needs to be informed by the student to the Institute before the commencement of the semester and an application for transfer of credits is required to be made by the student.

4	Skill Enhancement Course (SEC)	<p>A student is required to select a 'SKILL ENHANCEMENT COURSE' from the Basket offered by the Institute of Science, Nagpur for this purpose. A separate notification and guidelines in this regard shall be displayed by the Institute on its website.</p> <p>A student is allowed to earn credits for the 'SKILL ENHANCEMENT COURSE' by successfully completing online courses of equivalent credits from SWAYAM/NPTEL learning platforms or other Higher Education Institutions affiliated with RTM Nagpur University provided they are approved by the competent authority of the Institute of Science, Nagpur or the courses from Sector Skill Council.</p> <p>However, this needs to be informed by the student to the Institute before the commencement of the semester and an application for transfer of credits is required to be made by the student.</p>
5	Ability Enhancement Course (AEC)	A student is required to undergo and successfully complete the 'ABILITY ENHANCEMENT COURSE' as mentioned in this scheme of examination.
6	Indian Knowledge System Course (IKS)	A student is required to undergo and successfully complete the 'INDIAN KNOWLEDGE SYSTEM COURSE' as mentioned in this scheme of examination
7	Value Education Course (VEC)	A student is required to undergo and successfully complete the 'VALUE EDUCATION COURSE' as mentioned in this scheme of examination.
8	Co-Curricular Course (CC)	A student is required to select a 'Co-Curricular Course' as mentioned in this scheme of examination. The transfer of credit is not permissible for this type of course.
9	Field Project (FP)/ On the Job Training (OJT) /Community Engagement Project (CEP) / Research Project (RP)	A student is required to undergo and successfully complete this course as mentioned in the scheme of examination under the guidance of a supervisor/mentor assigned by the Institute of Science, Nagpur. This course must be corresponding to the 'MAJOR.' This course must be completed at the Institute of Science, Nagpur where the student has taken admission, and transfer of credit is not permissible for this type of course.

#### **Duration of the Program, Student Progression Path, and Provisions for Multiple Exit**

Duration of the B.Sc. shall be FOUR years with the provision for multiple exits as mentioned here:

#### **Multiple Exit:**

Students will have the flexibility to enter a program in odd semesters and exit a program after the successful completion of an even semester as per their future career needs:

- a. A student can exit the program after successful completion of semesters I & II having earned a requisite number of credits as mentioned in the scheme of examination and

additional 'NSQF\* Course or Internship' with 4 credits. Such a student shall be eligible for the award of a '**Certificate in Science**' by the Institute of Science, Nagpur.

**OR** a student can continue the program in 2nd year.

b. A student can exit the program after successful completion of semesters I, II, III, & IV having earned a requisite number of credits as mentioned in the scheme of examination and additional 'NSQF\* Course or Internship' with 4 credits. Such a student shall be eligible for the award of a '**Diploma in Science**' by the Institute of Science, Nagpur.

**OR** a student can continue the program in 3rd year.

c. A student can exit the program after successful completion of semesters I, II, III, IV, V & VI having earned a requisite number of credits as mentioned in the scheme of examination. Such a student shall be eligible for the award of a '**Three Year Bachelor of Science**' degree by the Institute of Science, Nagpur.

**OR** a student can continue the program in 4th year for either HONORS or a RESEARCH degree.

d. A student, on successful completion of all 8 semesters and having earned a requisite number of credits as mentioned in the scheme of examination shall be eligible for the award of either '**Bachelor of Science (Honors) Degree with Major and Minor**' OR '**Bachelor of Science (Honors with Research) Degree with Major and Minor**'.

**Table 2: Eligibility for Award of Certificate/Diploma/Degree/ Honors or Research Degree**

Levels	Qualification Title	Additional Credits to be Earned	Credit Earned	Semester	Year
4.5	UG Certificate in Science OR Continue with Major	4 (NSQF* Course or Internship)	44	2	1
5.0	UG Diploma in (Major & Minor) OR Continue with Major	4 (NSQF* Course or Internship)	88	4	2
5.5	Three Year Bachelor's Degree in Science OR Continue with Major & Minor	Not Required	132	6	3
6.0	Bachelor of Science (Honors) Degree with Major and Minor OR Bachelor of Science (Honors with Research) Degree with Major and Minor	Not Required	176	8	4

#### **Re-entry or Lateral Entry**

a. Students, opting for an exit at any level, will have the option to re-enter the programme

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from where they had left off, within THREE years of exit and complete the degree programme within the stipulated maximum period of SEVEN years from the date of admission to the first year.

b. Re-entry at various levels for lateral entrants in academic programmes shall be based on the earned and valid credits as-deposited and accumulated in the Academic Bank of Credits (ABC) through Registered Higher Education Institutions (RHEI) and proficiency test records.

c. Lateral entry into the programme of study leading to the UG Diploma / Three Year UG Degree / Four Year Bachelor's Degree with Honors/Research will be based on the validation of prior learning outcomes achieved and subject to availability of seats based on intake capacity.

#### **Availability of Major / Minor subjects and Intake Capacity**

Institute Science, Nagpur offers the following Subjects to the Students for Four Year Bachelor of Science (B.Sc.) as mentioned in Table 3 for the Four Year B. Sc. Program. Students will have to choose any two subjects at the time of admission. Out of these two subjects, the student will have to declare a choice of Major and Minor subject at the beginning of Semester III. Students will have to choose only one subject as a Major subject and only one subject as a Minor subject which obviously will be other than the Major subject she/he has chosen. Once the Minor subject is chosen, a student must pursue all the courses from the basket of that Minor only.

**Table 3: List subjects with Intake Capacity**

<b>S.No.</b>	<b>Available Subjects</b>	<b>Intake Capacity (Major Subject)</b>	<b>Intake Capacity (Mnior Subject)</b>
1	Physics	40	40
2	Chemistry	40	40
3	Mathematics	40	40
4	Statistics	24	24
5	Zoology	24	24
6	Botany	24	24
7	Environmental Science	16	16
8	Computer Science	16	16
9	Electronics	16	16
	Total	240	24

Note:- Depending upon the availability of the seats, admission to major or minor will be allotted at the beginning of B.Sc. Semester III, based on the result of B.Sc. First year.

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## Two - Years ( Four Semester PG Course)

### Master of Science - M.Sc.

#### PG Programs Available at the Institute

##### Details of Eligibility for M.Sc. Semester I Admission

Subject to their compliance with the provisions of this direction and of other ordinances in force from time to time, the following applicant candidates shall be eligible for the admission to Master of Science and examinations thereof.

Table 1: Eligibility for M.Sc. Semester I Admission

A.	For M.Sc. (Physics) Semester-I	For admission to the M. Sc. Semester I in Physics, a candidate shall have offered Physics as one of the Major subjects at the qualifying B.Sc. Examination.
B.	For M.Sc. (Chemistry) Semester-I	For admission to the M. Sc. Semester I in Chemistry, a candidate shall have offered Chemistry / Industrial Chemistry as one of the Major subjects at the qualifying B.Sc. Examination.
C.	For M.Sc. (Mathematics) Semester-I	For admission to the M. Sc. Semester I in Mathematics, a candidate shall have offered Mathematics as one of the Major subjects at the qualifying B.Sc. Examination.
D.	For M. Sc. (Statistics) Semester-I	For admission to the M. Sc. / M.A. Semester I in Statistics, a candidate shall have offered Statistics/Mathematics as one of the Major subjects at the qualifying B.Sc./B.A. Examination. (Preference will be given to the student having Statistics at the UG level)
E.	For M.Sc. (Botany) Semester-I	For admission to the M. Sc. Semester I in Botany, a candidate shall have offered Botany as one of the Major subjects at the qualifying B.Sc. Examination.
F.	For M.Sc. (Zoology) Semester-I	For admission to the M. Sc. Semester I in Zoology, a candidate shall have offered Zoology as one of the Major subjects at the qualifying B.Sc. Examination
G.	For M.Sc. (Environmental Science) Semester-I	For admission to the M. Sc. Semester I in Environmental Science a candidate shall have offered Environmental Science/Botany/Zoology/Microbiology/Biochemistry as one of the Major subjects at the qualifying B.Sc. Examination. (Preference will be given to the student having Environmental Science at the UG level)

Candidates shall have passed any one of the above examinations from Rashtrasant Tukadoji Maharaj Nagpur University or any other statutory University of India or abroad, recognized by the UGC or any other concerned apex regulatory authority / body of India.

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Duration of the Program. Student Progression Path and Provisions for Multiple Exit Duration of the M.Sc. shall be TWO years with the provision for exit at the end of first year.

Exit Option: Students will have the flexibility to enter a program in odd semesters and exit a program after the successful completion of even semester as per their future career needs:

a. A student can exit the program after successful completion of semesters I & II having earned requisite number of credits as mentioned in the scheme of examination. Such a student shall be eligible for the award of 'PG Diploma in Major Subject' by the Institute of Science, Nagpur OR the student can continue the program in 2nd year.

b. A student, on successful completion of all the 4 semesters and having earned requisite number of credits as mentioned in the scheme of examination shall be eligible for the award of either 'Master of Science Degree with Major subject'.

Table 2: Eligibility for Award of Certificate/Diploma/Degree/Honours or Research Degree

Qualification Title	Credit Earned	Semester	Year
PG Diploma in Major Subject	44	2	1
Master of Science Degree with Major subject	88	4	2

Re-entry or Lateral Entry

a. Students, opting for exit at the end of first year, will have the option to re-enter the programme from where they had left off, within THREE years of exit and complete the degree programme within the stipulated maximum period of FIVE years from the date of admission to first year.

b. Re-entry at various levels for lateral entrants in academic programmes shall be based on the earned and valid credits as deposited and accumulated in the Academic Bank of Credits (ABC) through Registered Higher Education Institutions (RHEI) and proficiency test records.

c. Lateral entry into the programme of study leading to the PG Diploma / Two Year Master of Science in Major Subject will be based on the validation of prior learning outcomes achieved and subject to availability of seats based on intake capacity.

Availability of 'Major' subjects and 'Intake Capacity' : Institute Science, Nagpur will offer following Major Subjects to the Students for Two Year Master of Science (M.Sc.) in

Table 3: List Major subjects with Intake Capacity

Sr. No.	Subject Options for Major	Intake Capacity
1.	Physics	36
2.	Chemistry	36
3.	Mathematic	36
4.	Statistics	22
5.	Zoology	22
6.	Botany	22
7.	Environmental Science	11+ May be Increased
	Total	185

Teaching and Examination Scheme  
Master of Science Two -Year (Four Semester Degree Course)

		M.Sc. Sem. - I (Major Subjects)									
		Name of the Course (Title of the Paper)									
Sr. No.	Level	Course Category	Chemistry	Physics	Mathematics	Botany	Zoology	Statistics	Environmental Science		
1		DSC Paper I and II	Inorganic Chemistry  Organic Chemistry	Mathematical Physics  Solid State Electronics	Real Analysis  Complex Analysis	Cell and Molecular Biology  Ethnobotany and Medicinal Plants	Biotechnology  Biotechniques and Biostatistics	Distribution theory  Estimation theory	Environmental Chemistry  Environmental Biology, Microbiology and Biotechnology		
2	6.0	DSC Lab 1 : Practical – I  DSE Elective	Inorganic and Organic Chemistry Practical (Based on Paper 1+2) 1. Bioorganic Chemistry 2. Chemistry of Biomolecules 3. Thermodynamics and Electrochemistry 4. Advance Analytical Techniques 5. Equivalent MOOC course	Based on Paper I and Paper II 1. Numerical Methods 2. Introduction to Nano – science & DSE Lab	Based on Paper I and Paper II 1. Integral Equations 2. Integral Transforms 3. Numerical Analysis 4. Fuzzy Mathematics	Based on Paper I and Paper II a. Phycology b. Mycology c. Palynology  Lab (Based on Elective) a. Phycology Lab b. Mycology Lab c. Palynology	Based on Paper I and Paper II 1. Animal Physiology-I (Physiology of Digestion & Excretion) 2. Fish & Fisheries-I (General Studies) 3. Mammalian Reproductive Physiology-I (Reproductive process in Male)	DSC I & DSC II & DSE I 1. Sampling theory OR 2. Time series analysis	Based on Paper I and Paper II 1. Atmospheric Science & Climate Change OR 2. Environmental Legislation And Policy		
3		RM Research Methodology	Paper V: Research Methodology	Research Methodology	Research Methodology	Research Methodology	Research Methodology	Research Methodology	Research Methodology	Research Methodology	

M.Sc. Sem. -II (Major Subject)

Sr. No.	Level	Course Category	Chemistry	Physics	Mathematics	Botany	Zoology	Statistics	Environmental Science
1.		DSC Paper I and II	Physical Chemistry	Quantum Mechanics -I	Paper 1: Algebra	Plant Metabolism	Biodiversity and Conservation	Elementary Stochastic processes	Environmental Ecosystem and Biodiversity
2.			Analytical Chemistry	Classical Mechanics	Paper 2: Topology	Plant biodiversity & Conservation	Microtechniques	Testing of hypothesis	Analytical Techniques for Environmental Monitoring
3.	6.0	DSC Lab I : Practical - I	Physical Chemistry and Analytical Practical	Based on Paper I and Paper II	Based on Paper I and Paper II	Based on Paper I and Paper II	Based on Paper I and Paper II	Practical on DSC 3 & DSC 4 & DSE2	Based on Paper I and Paper II
4.		DSE Elective	<ol style="list-style-type: none"> <li>1. Solid state and organometallic chemistry</li> <li>2. Organic Reaction Mechanism</li> <li>3. Quantum, Statistical and Nuclear Chemistry</li> <li>4. Separation Techniques in Analytical Chemistry</li> <li>5. Equivalent MOOC course</li> </ol>	<ol style="list-style-type: none"> <li>1. Applied Digital Electronics</li> <li>2. Nuclear Physics-I &amp; DSE Lab</li> </ol>	<ol style="list-style-type: none"> <li>1. Classical Mechanics</li> <li>2. Ordinary Differential Equations</li> <li>3. Discrete Mathematics</li> <li>4. Combinatory</li> </ol>	Elective: a. Plant growth Regulator b. Hydrobiology and Limnology c. Paleobotany  Lab (Based on Elective) a. Plant growth Regulator Lab b. Hydrobiology and Limnology Lab c. Paleobotany	Elective:1: Animal Physiology-II (Physiology of Circulation) Elective:2: Fish & Fisheries-II (Applied Fisheries) Elective:3: Mammalian Reproductive Physiology-II (Reproductive process in Female)	Linear models and Designs Or Reliability theory	<ol style="list-style-type: none"> <li>1. Environmental Sampling and Resource Management</li> <li>OR</li> <li>2. Environmental Impact Assessment and Audit</li> </ol>
5.		OJT/PP	Paper V: Internship/ Apprenticeship/Field Project (Related to DSC)	Internship/ Apprenticeship/ Field Project (Related to DSC)	Internship/ Apprenticeship/ Field Project (Related to DSC)	Internship/ Apprenticeship /Field Project (Related to DSC)	Internship/ Apprenticeship /Field Project (Related to DSC)	Internship/ Apprenticeship /Field Project (Related to DSC)	Internship/ Apprenticeship /Field Project (Related to DSC)



**(क) संशोधन (पीएच.डी.) [Research (Ph.D.)]:**

१. विज्ञान आचार्य पदवीसाठी संशोधन करू इच्छिणाऱ्या विद्यार्थ्यांना संस्थेत उपलब्ध असणाऱ्या साधन-सोयी, मार्गदर्शक संख्या व विषयाची क्षमता यानुरूप व विद्यापीठाच्या नियमानुसार प्रवेश दिला जाईल. त्यासाठी अगोदर आवेदन पत्र स्वीकारले जाईल.

२. संशोधन करणारे विद्यार्थी व संस्थेतील संशोधन करणारे शिक्षकवृंदांना शिक्षण शुल्क एका हप्त्यात शुल्क तक्त्यानुसार भरावे लागेल. तसेच त्यांना दरवर्षी न चुकता तक्त्यानुसार शुल्क भरावे लागेल अन्यथा रुपये ५० प्रतीमाह दंड आकारण्यात येईल. नंतरचे शुल्क भरण्यापूर्वी विद्यार्थ्यांने मागील सहामाहीच्या उपस्थिती व संशोधन कार्याचा अहवाल मार्गदर्शक व विभाग प्रमुख यांचेमार्फत सादर करणे आवश्यक आहे. या अहवाला अभावी शुल्क घेतले जाणार नाही व प्रवेश रद्द केला जाईल.

३. संशोधन कार्यासाठी वापरण्यात येणाऱ्या संस्थेच्या उपकरणांची जबाबदारी विद्यार्थ्यांची असेल व झालेल्या नुकसानीची विद्यार्थ्यांस भरपाई करावी लागेल.

४. रसायने व खर्ची होणाऱ्या व इतर वस्तुंची मागणी उपलब्धतेनुसार मर्यादित प्रमाणात पुरविली जाईल.

५. विद्यार्थ्यांस आवश्यकतेनुसार संस्थेतील शैक्षणिक कार्यक्रमात सहभागी व्हावे लागेल.

६. संशोधन करणाऱ्या राखीव वर्गातील विद्यार्थ्यांनी प्रवेश घेतेवेळी जातीचे व उत्पन्नाचे प्रमाणपत्र जोडणे आवश्यक आहे.

**५. शैक्षणिक अभ्यास दौरा (Educational Study Tour):**

संस्थेच्या अभ्यासक्रमानुसार विद्यार्थ्यांचे शैक्षणिक अभ्यास दौरे आयोजित केले जातील.

**६. सवलती, शिष्यवृत्त्या आणि पारितोषिके (Concessions, Scholarships and Prizes):**

**(अ) सवलती (Concessions) -**

**(I) अनुसूचित जाती/नवबौद्ध जमाती/भटक्या जमाती व विमुक्त जाती/इ.मा.व. करीता शिक्षण व इतर शुल्कात मिळणाऱ्या सवलती (Declaration of Caste freeship) (For SC/ Navboudha, ST.VJ.NT and OBC):**

**पात्रता व इतर आवश्यक बाबी (Eligibility and Others)**

(१) पालक व विद्यार्थी महाराष्ट्र राज्याचा रहिवासी असावा.

(२) या सवलत प्राप्तीसाठी अर्ज विहित नमुन्यात प्रवेश मिळाल्यापासून एक महिन्याचे आत संस्थेच्या कार्यालयात सादर करावा.

(३) प्रत्येक वर्षी नवीन अर्ज करणे आवश्यक आहे.

टीप :- भारत सरकारची शिष्यवृत्ती मिळण्यास पात्र नसलेल्या विद्यार्थ्यांनी वरील सवलतीचा फायदा घ्यावा.

**(II) आर्थिकदृष्ट्या मागासवर्गीयांकरिता (इ.डब्ल्यू.एस.) (For Economically Weaker Section):**

**पात्रता व इतर आवश्यक बाबी**

(१) पालकाचे सर्व तऱ्हेने प्राप्त मागील वर्षाचे (२०२३-२०२४) उत्पन्न रु. ८,००,००० च्या वर नसावे.

(२) विद्यार्थी महाराष्ट्र राज्याचा रहिवासी असावा.

(३) या सवलत प्राप्तीसाठी अर्ज विहित प्रपत्रात प्रवेश मिळाल्यापासून १५ दिवसांचे आत संस्थेच्या कार्यालयात सादर करावा. त्यानंतर आलेले अर्ज विचारात घेतले जाणार नाहीत.

(४) प्रत्येक वर्षी नवीन अर्ज करावा लागेल.

(५) अर्ज सुव्यवस्थिपणे व पूर्ण भरलेले असावेत. तसेच त्यातील सर्व माहिती सत्य असावी. माहिती खोटी/त्रुटीपूर्ण आढळल्यास अर्ज कोणत्याही पातळीवर रद्द होतील.

(६) अर्जासोबत पालकाच्या मागील वर्षाचे सर्व तऱ्हेने प्राप्त उत्पन्न दर्शविणारे सक्षम अधिकऱ्याचे मूळ प्रमाणपत्र जोडावे.