Bacteriology Microbial genetics, bacteriophages and molecular biology.
Industrial and Applied Microbiology Industrial processes utilizing microorganisms. Fermentation.
Production of antibiotics, amino acids and food. Remediation of industrial effluents and pollution.
Photosynthetic microbial production.
Plant virology Detailed chemical and physical properties of viruses. Virus architecture. Replication and genome structure. Multi-component viruses and satellitism.
Animal virology Physico-chemical structure of viruses. Molecular biology, morphogenesis and replication. Detailed study of selected virus families. Defective viruses. Interferon.
Gene manipulation Selection and isolation of genes. Restriction and ligation of DNA molecules. Vectors and cloning strategies. Expression and selection of recombinant genes. Implications and applications of recombinant DNA research.
Biotechnology Theoretical and applied aspects are covered in the above sections.
Practical work is based on the above syllabus. Practical reports, essays and class tests collectively comprise the class mark, which, together with the June examination, forms part of the final mark.

Biochemistry Honours
The course consists of lectures on selected advanced topics such as nutritional biochemistry, genetic engineering, drug metabolism, steroids, enzymes, hormones, cancer, food chemistry and brewing; advanced enzyme kinetics; a seminar including a literature review on a general biochemical topic; two essays and a research project.

Microbiology Honours
The course consists of lectures, tutorials and seminars on advanced aspects of Microbiology including virology, serology, molecular biology, microbial biochemistry and microbial genetics. Each candidate is required to submit two copies (one to be returned) of a report on practical work done on a specific project during the course, and these together with all seminars, essays and practical reports will be considered part of the final examination.

Biotechnology Honours
Candidates may have either Microbiology or Biochemistry as major BSc subjects. Candidates with other majors will be considered.

The course consists of lectures, seminars and essays covering a series of topics in Biotechnology such as fermentation technology, genetic manipulation, applied immunology, enzyme engineering, food technology, process technology, and selection and control of industrial microorganisms.

Practical work will consists of an 18 week course concentrating on small projects offering exposure to methods and techniques essential to the subject. This will be followed by an 18 week project of original investigation.

All seminars, essays and practical reports will be considered part of the final examination.

Leather Science Honours
Candidates must have either Chemistry, Biochemistry or Microbiology as major BSc subjects.

The course consists of lectures, seminars and essays covering topics Leather Science, Leather Technology, Protein Chemistry, Biotechnology, Environmental Science, Statistics, Business Management and Economics.

Practical work will consist of modules in selected aspects of leather manufacture and short projects will be undertaken in the industrial sector. A research project covering an original investigation will be submitted at the end of the year.

All seminars, essays and practical reports will be considered a part of the final examination.

Further Studies
Suitably qualified students are encouraged to proceed to the research degrees of MSc and PhD under the direction of the staff of the Department.

A Leather Science Masters is open to suitably qualified students holding a BSc (Hons) degree or its equivalent in a field of study acceptable to the Department. The course is designed to provide advanced study in Leather Science and student evaluation will be by means of a thesis.

BOTANY

Botany is a three-year major subject which may be studied for degree curricula in the Faculty of Science. Candidates majoring in Botany must include Chemistry IP or IS in their curriculum. See Regulations S.1(2), S.4 and S.9. One, or in some cases two, Botany courses are allowed as credits for other degree/diploma curricula in the Faculties of Arts, Education and Social Science.

The botany courses offered at Rhodes University are as follows:
1. **Basic Botany** - 1st year of study
2. **Intermediate Botany** - 2nd and 3rd year of study -leading to a BSc degree together with another major subject.
3. **Advanced Botany** - 4th year of study usually specialising in some aspect of botany but may be studied in combination with another major. Results in a BSc(Hons) degree.
4. **Research Botany** - Research degrees in specialised subjects usually in specific areas of interest of the staff of the department lead to an MSc or PhD degree.

BASIC BOTANY - BOTANY I

This is a general course in botany which provides an overall background to the structure, function, diversity and relationship of plants to their environment. The main objective of the course is to supplement and clarify basic concepts about plants and reveal the exciting diversity of fields that are available within the study of botany. Although basic botany can be regarded as a terminal course, the main objective is to provide a grounding for further study. The course is divided into 2 units, Botany 101 and 102, each comprising a number of four- week units of 5 lectures and 1 practical per week. Additional tutorial sessions will be given in some units.

Botany 101: Plant Systems and Ecology
Courses: Ecology/Lower and Higher Plant Diversity/Plant Taxonomy

Botany 102: Plant Structure and Function
Courses: Cell organisation and structure/Energy production and Plant Physiology/Botany and the Enviroment.
Normally Botany 101 will be the first unit course, and Botany 102 the second unit course.

INTERMEDIATE BOTANY - BOTANY II & III

The main objective of this course is to give students a thorough and in-depth understanding of the different core components of botany with greater emphasis placed on the areas of expertise of the staff members. The various units of the course are arranged within the two years to form a natural progression from simple to complex and/or provide a balance of the type of subject matter within each year. However, the arrangement and structure of these units will vary from year to year thus allowing for a flexible and dynamic course. Similarly each unit may be structured in a different way with varying emphasis on lectures, tutorials and practical components. Field trips and excursions may be organised as part of certain course units.

Botany 201: Plant Systematics and Ecosystems
Prerequisite: Botany 101
Core courses: Angiosperm classification/Ecosystem Ecology/ Biology of Marine Plants/Plant collection.
Options: Community Structure and Dynamics/Regulation of Development/Ethnobotany

Botany 202: Development and Metabolic Regulation
Prerequisite: Botany 102
Core courses: Developmental and Plant Anatomy/Carbon and Nitrogen Metabolism/ Statistics
Options: Palaeobotany/Carbon Transport in Plants.

Botany 301: Plant Systematics and Ecology
Prerequisite: Botany 201
Core course: Field and Quantitative Ecology/Taxonomy/Biosystematics/Mini thesis
Options: Applied Ecology/Global Warming.

Botany 302: Stress Regulation in Plants
Prerequisite: Botany 202

Core course: Ecological Plant Physiology/Plant Stress Regulation/Mini thesis continued.
Options: Biogeography/Evolution of Phloem loading.

ADVANCED BOTANY -BOTANY HONOURS
The honours degree course allows for specialisation in a chosen direction within the field of botany. It involves seminars, tutorials and project work (See separate honours course outline). The course is intended to provide the student with the opportunity for in-depth study in particular aspect of the subject, which may be seen as a relevant training for subsequent employment or as a step between an undergraduate degree and a research degree. Joint Honours Courses may be followed where aspects of the Botany Honours course may be taken in combination with courses in some other Departments (see Regulation S.15).

BIOLOGY I AND IP
Biology I is a one-year course which may be studied for degree/diploma curricula in the Faculties of Science, Arts, Education and Social Science. This course, offered jointly by the Departments of Botany, Zoology and Entomology, and Microbiology is a compulsory prerequisite for some courses.

Biology IP is a compulsory first year credit in the BPharm degree, differing from *Biology I* in that there are approximately 30 additional lectures in Microbiology.
Detailed information on the types of curricula involving Botany or Biology I, is available from the Head of the Department.

Biology I Part I *Plant biology* Introduction to genetics and ultrastructure of cells. Structure and function in plants. Secondary plant products. Plant diversity: range of form and reproduction in selected groups of plants from algae, fungi, cryptogams and seed plants. Short introductory courses in chemotaxonomy and poisonous and medicinal plants are given.

Part II *Animal biology* Introduction to tissue and organ histology. Nutrition, digestion and excretion. Circulation and respiration. Nervous systems. Parasitology and microbiology.

MSc AND PhD DEGREES

The degrees of MSc and PhD are offered in the Department. The MSc and PhD are taken as prescribed in the General Regulations.

CHEMISTRY

Chemistry may be taken as a major subject in combination with the subjects listed in regulation S.9.

CHEMISTRY COURSES

Chemistry is a three-year major subject in the Faculty of Science. Chemistry I may be included in curricula in the Faculties of Arts, Education, Pharmacy and Social Science.

Chemistry IS and IP 4 lectures, 1 tutorial and 3 hours of practical weekly.

Note *It will be assumed that students in the class have a knowledge of chemistry at the standard of physical science at Matriculation level or its equivalent.*

Chemistry IR The Chemistry IS and IP theory examinations in June are write-off examinations of the topics covered in the first half of the year (Part A). Students obtaining **less than 40% but not less than 20%** in the Part A theory examination are not permitted to continue in Chemistry IS or IP but join the remedial course **Chemistry IR**, to revise Part A topics for re-exmanination in November. In the first half of the following year, Chemisrty IR students preview Part B topics prior to rejoining the Chemistry IS or IP streams in July. Such students will thus take at least two years to complete Chemistry IS or IP. Students obtaining **less than 20%** in the Part A theory examination are not permitted to continue with any Chemistry course in that year.

Chemistry II 5 lectures and 5 hours of practical weekly.

Chemistry III 5 lectures and 5 hours of practical weekly.

Chemistry Honours See below.

CONTENTS OF COURSES

Chemistry IS This course is a general introduction to chemistry for students registered for BSc, or degrees other than BPharm. The course covers quantum ideas, atomic structure, the periodic table, states of matter, electrochemistry, radiochemistry, rates and energies of chemical processes, chemical equilibrium and systematic inorganic and organic chemistry. The practicals are an introduction to the techniques of chemistry.

Chemistry IP This course is for students registered for the BPharm degree. The content and standard are similar to those of Chemistry IS. Students who pass either Chemistry IS or Chemistry IP may continue to Chemistry II and Biochemistry II.

Chemistry II Chemistry of the main block (s and p) elements; analytical chemistry; principles of thermodynamics and kinetics. Organic stereochemistry; alicyclic hydrocarbons; advanced aspects of substitution and elimination reactions and the chemistry of alkenes and alkynes; benzenoid aromatic compounds; introduction to spectroscopic methods in structure elucidation, electrochemistry; instrumental analysis; polymer chemistry and surface chemistry. Entrepreneurial Project.

Chemistry III Advanced aspects of the chemistry of organic carbonyl compounds; selected molecular rearrangements; heterocyclic chemistry; carbohydrates; retrosynthetic analysis; spectroscopic analysis of organic compounds. Kinetics, heterogeneous catalysis; quantum mechanics; atomic structure; spectroscopy; thermodynamics; f-block elements; transition metals and co-ordination chemistry; organometallic chemistry and bioinorganic chemistry. Industrial Project.

Chemistry Honours Students who achieve a satisfactory standard in Chemistry III will be accepted for the Honours course. The course consists of lectures on advanced topics, a review essay and a research project.

Further studies Suitably qualified students are encouraged to proceed to the research degrees of MSc and PhD under the direction of the staff of the Department.

CLASSICS

The department of Classics offers courses in four interrelated subjects: Classical Civilization, Latin, Classical Greek and Hellenistic Greek (Biblical Greek).
Latin is a three-year major subject which may be studied for degree curricula in the Faculty of Arts. Only candidates who have matriculated in Latin are admitted to Latin IA. Students who wish to do Latin and have not taken Latin for Matriculation should register for Latin IB. (See also Regulation A.10(1)).
Greek is a three-year major subject which may be studied for degree curricula in the Faculties of Arts and Social Science. No previous knowledge of Greek is required to enter either Greek I or Hellenistic Greek. Hellenistic Greek is an alternative course for students intending to go on to Greek IIB.

Classical Civilization is a two-year major subject which may be studied for degree curricula in the Faculty of Arts. This course is designed to provide a sound general background of knowledge of Greek and Roman civilization. See regulation A.8 to A.12.
Latin IB No previous knowledge of Latin is required for this course. Candidates who achieve a satisfactory standard may proceed to Latin II on the recommendation of the Head of the Department.
Latin IA The reading of selected Latin texts. Translation from Latin into English, with

SECOND YEAR
Theory of Art II As described under **PAINTING**
Graphic Art I (a) compositional drawing (b) mixed media (c) introductory print-making. (d) *Anatomy* A study of the bone and muscular structure of the human body.

THIRD YEAR
Theory of Art III As described under **PAINTING**
Graphic Art II (a) Life drawing (b) Print-making.
FOURTH YEAR
Theory of Art IV As described under **PAINTING**
Graphic Art III Composition

COURSE C (SCULPTURE)
SECOND YEAR
Theory of Art II As described under **PAINTING**
Sculpture I (a) Modelling. (b) *Anatomy* A study of the bone and muscular structure of the human body.

THIRD YEAR
Theory of Art III As described under **PAINTING**
Sculpture II (a) Life drawing (b) Carving or metal sculpture.

FOURTH YEAR
Theory of Art IV As described under **PAINTING**
Sculpture III Composition

NB *All students in the third and fourth years of study may take courses in etching, engraving and pottery.*
COURSE D (PHOTOGRAPHIC ARTS)
SECOND YEAR
Theory of Art II (a) *History of Art* As described under **PAINTING**. (b) *History and appreciation of photography.*
Photographic Arts I Studio photography
THIRD YEAR
Theory of Art III (a) *History of Art* As described under **PAINTING**. (b) *Appreciation of Art.*
Photographic Arts II (a) Outdoor project (b) Combined methods project.
FOURTH YEAR
Theory of Art IV As described under **PAINTING**,
Photographic Arts III Composition

DIPLOMA IN FINE ART
The syllabuses for the various subjects taken for the Diploma are the same as for those of the same name taken for the degree of B Fine Art.
DESIGN
All practical courses in the Department have a Design component and Design is thus an accredited subject in all the practical courses.

MASTER OF FINE ART

This course is divided equally into theoretical and practical Sections and is marked as such.
DEGREE BY COURSEWORK: Students who obtain 70 %, or more, in their final practical examination may enrol for the degree by couse work of which 70 % of the mark is for coursework and 30 % of the mark for an extended essay. All students must submit a portfolio for approval by the department.

MASTER'S DEGREE

This entails the submission of a thesis on an approved subject in the fields of Art History or Art Theory.

FRENCH AND ITALIAN

French is a three-year major subject which can be studied for degree curricula in the Faculty of Arts. Italian is a one-year non-continuing course not offered at present.
FRENCH
French Preliminary This course is designed to enable students who have not taken French as a matriculation subject to acquire the essential elements of the language and civilisation. Students who obtain a satisfactory pass in French IP may go directly to French I. In exceptional cases, students may proceed directly to French II with the permission of the Head of Department.

French I This course is taken by students who have matriculated in French. The syllabus includes: Language and culture, unseen translation (version) and prose composition (thème); and study of French authors: French Literature from the 17th to the 20th centuries, literary criticism and essay writing.
French II Language and culture; translation work, prose composition (thème). French literature and civilization from the 17th to the 20th centuries. Literary criticism (explication de textes) and essay writing (dissertation littéraire).
French III Language and culture; translation work, advanced prose composition (thème). French literature and civilization from the 16th to the 20th centuries. Literary criticism (explication de textes) and essay writing (dissertation littéraire).
Licence ès Lettres (Honours Course)
L'examen se compose de quatre épreuves écrites et d'une épreuve orale d'une heure.
Epreuve I Thème et version (Le candidat doit obtenir un minimum de 50% dans cette épreuve).
Epreuves 2 a 4 Le candidat choisira trois sujets d'étude parmi les auteurs ou les genres datant du moyen âge au vingtième siècle, suivant ses intérêts et les spécialités des membres du Département.:
Une dissertation de recherche, dont la longueur ne dépassera pas 10 000 mots, peut se substituer à l'une des épreuves, dans la série 2 à 4.
Epreuve Orale Analyse textuelle d'un texte littéraire, classique ou moderne. Exposé critique.
Maîtrise ès Lettres (MA Course)

Les candidats pourvus de la Licence ès Lettres (BA Honours) sont admis à se présenter en Linguistique et en Littérature Françaises (MA) sur la recommendation du Directeur de l'Institut d'Etudes Françaises, avec agrément de la Faculté des Lettres, soit (a) en subissant quatre épreuves écrites et une épreuve orale d'une heure: soit (b) en soutenant une thèse dont le sujet aura été choisi par le candidat et agréé par la Faculté des Lettres.

ITALIAN
***Italian IB** This course is designed to enable students who have not taken Italian as a matriculation subject to acquire the essential elements of the language, literature and civilization. The course includes translation from Italian into English and English into Italian, reading, conversation and a general outline of literature and civilisation.
** Not offered at present*

MODERN FICTION
For a description of this course, see the section on Interdepartmental Studies.

GEOGRAPHY

Geography is a three-year major subject which may be studied for degree curricula in the Faculties of Science, Arts and Social Science, and is frequently read by students in the Faculty of Education.
NOTES
1. Geography I provides a sound foundation for the student majoring in Geography as well as a general course for the student studying Geography for one year. Students who have not studied Geography at shool level are welcome to read Geography.
2. Geography has no compulsory ancillary subjects but has recently been combined, as a major, with: African Languages, Afrikaans, Anthropology, Botany, Chemistry, Classics, Economics, Education, English, Fine Art, Geology, History, Human Movement Studies, Industrial Psychology, Industrial Sociology, Journalism, Linguistics and English Language, Mathematics, Modern European Languages, Music, Philosophy, Physics, Political Studies, Psychology, Sociology, Zoology and Entomology.
3. Students are expected to participate in Departmental excursions. Costs are kept as low as possible. Fieldwork, to be carried out during one of the vacations, is compulsory in Geography III and Honours. Students are encouraged to attend the South African Student Geographical Conference, which is held at a different university each year.

Geography I H & P
The full credit course, Geography I, consists of the two components Geography IH (Human Geography) and Geography IP (Physical Geography). Normally these are taken concurrently by students who intend to major in Geography. However, one or other component may be recommended as a half-credit foundation course for students who attain 30 Swedish points for Matriculation and have passed English First Language, Higher Grade.

Geography I
The following courses are offered: ecology, climatology, economic geography, geomorphology and hydrology, population geography, urban geography. Practical work is an integral part of the course.

Geography II
Course work emphasises the principles of human and physical geography. Practical work is related to the lecture courses and to the development of research techniques.

Geography III
Subject to timetable constraints three courses may be selected from such options as ecology, economic geography, hydrology, political geography, Quaternary studies, soils and soil erosion, urban geography. In addition there is a core course on geographical methods. Practical work includes advanced quantitative methods and data processing, including an introduction to Geographic Information Systems. Projects enable students to pursue their own research interests.
Geography Honours Course Each student is required to take four courses (depending on staff interests, a choice of couses will be offered): to submit a research project; and to present two seminars during the year.
Representative courses which may be offered include: African urban development; applied hydrology; biogeography; economic geography; fluvial geomorphology; geohydrology, Quaternary studies; water resources management. Arts students are reminded of the alternative route to Honours. See regulation A.16(3) and A.16(4).
NB *Parts of the Geography degree may be taken in conjunction with courses in other departments. For example, a student could write one paper in Botany or Economics. Where approximately 50 % of a student's courses are examined in another department, a joint degree is awarded e.g. Honours in Geography/Geology. Any combined degree must be agreed to by both Heads of Department concerned and in the Faculty of Arts by the Faculty through the Humanities Higher Degree Committee.*

BSc Honours in Environmental Water Management
Each student is required to read four courses; write a dissertation; and present two seminars during the year. At least three of the courses must be chosen from those offered by the Department and that are directly related to Water Resources or Hydrology e.g. Applied Hydrology, Water Resources Management, Fluvial Geomorphology, Geohydrology.
The fourth course must be relevent to the needs of Environmental Water Managers and must be approved by the Head of Department. Suitable fourth courses include: Geographic Information Systems, Quaternary Studies, Environmental Ecology.
The dissertation must be water related and the topic must be approved by the Head of Department.
Interdisciplinary Honours Degrees
BA Honours in Development Studies (in the Department of Geography)
Each student is required to read four courses; write a dissertation; and present two seminars during the year. At least two of the courses must be chosen from those offered by the Department for the Interdisciplinary Degree in Development Studies: Economic Geography, Geographic Information Systems and/or Population, Resources and Development. The remaining courses must ge chosen from those offered by the other participating departments after consultation with the Head of the Department of Economics and the Dean of the Faculty.
BA Honours in Industrial Society (in theDepartment of Geography)
Each student is required to read four courses; write a dissertation; and present two seminars during the year. At least two of the courses must be chosen from those offered by the Department for the Interdisciplinary Degree in Industrial Society: Economic Geography, Geographic Information systems. The remaining courses must be chosen from those offered by the other participating departments after consultation with the Haed of the Department of Sociology and Industrial Sociology and the Dean of the Faculty.
Master's and Doctoral degrees

GEOLOGY

Geology is a three-year major subject which may be studied for degree curricula in the Faculties of Science and Commerce.
One or two courses in Geology are allowed as credits for degree/diploma curricula in the Faculties of Arts and Social Science.
Fieldwork is a necessary part of Geology courses and a field-course fee is payable annually.
Students taking Geology as a major subject must include one course in Chemistry in their first year of study, and are strongly advised to include additional courses in Chemistry, Physics, Mathematics or Computer Science in their curriculum.
Geology IF This is a half-course offered to students taking Science Foundation curricula. Sucessful completion will allow students to proceed to Geology I. This course provides an introduction to the major concepts and subdisciplines of Geology and emphasises the importance of Geology to environmental studies.
Geology I An introduction to the major fields of Earth Science. Topics covered by the course include Earth structure, geophysics and plate tectonics; surface processes and geomorphology; crystallography and mineralogy; palaeontology and sedimentology; volcanology and igneous and metamorphic petrology; ore deposits; stratigraphy and the geological history of southern Africa. Practical work includes the reading and interpretation of geological maps; the study and identification of fossils, mineral and rock specimens; and simple field exercises. Attendance at scheduled field courses over at least two weekends is compulsory.
Geology II The course emphasizes the principles of mineralogy, metamorphic geology, sedimentology, palaeontology and structural geology.
Practical work is related to the lecture course and includes a compulsory one-week field course on field methods and mapping techniques, normally held during the September vacation.
Geology III The course emphasizes earth history and geotectonics, igneous, metamorphic and sedimentary systems, palaeontology and mineral deposits.
Practical work is related to the lecture courses and includes a compulsory one-week field course, normally held during the April vacation.

Geology Honours Course
The course comprises lectures, tutorials, seminars and related practical work. Each student is required to take four courses from a selection offered. Depending on staff availability, the following may be offered: mineralogy and crystallography; igneous petrology; metamorphic petrology; sedimentology; palaeontology;volcanology; structural geology and geotectonics; economic geology; geohydrology; remote sensing and GIS.
Participation in scheduled field schools is compulsory.
The results of a research project, completed during the year, should be submitted in the form of a short thesis. In this connection, prospective candidates should write to the Head of the Department for guidance at the time of applying for admission.

Master's and Doctoral degrees
The Department pursues an active programme of research into a wide range of problems in Earth Science. Students with Honours degrees Suitably qualified students are encouraged to proceed to the research degrees of MSc, MA, MSocSc and PhD, under the direction of the staff of the Department. The degree of MSc in Hydrology or Geohydrology in the Department of Geography may also be awarded.