

NORTH-EASTERN HILL UNIVERSITY  
SHILLONG - 7930 01.

.....

No:AC/28-1/CONF/87-920

April 24, 1987.

All Members of the  
Academic Council,  
N.E.H.U.

Subject : Agenda Papers for the 28th meeting of the  
Academic Council.

Sir/Madam,

I am forwarding herewith the Agenda Papers for the  
28th meeting of the Academic Council scheduled to be held on  
the 27th April, 1987 at 11:00 a.m. for favour of your infor-  
mation and consideration.

Yours faithfully,



( D.C. Pant )  
Registrar.

Enclo : a.a.

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NORTH-EASTERN HILL UNIVERSITY  
SHILLONG - 793001.

A G E N D A

TWENTYEIGHTH MEETING  
OF THE  
ACADEMIC COUNCIL

APRIL 27, 1987.

NORTH-EASTERN HILL UNIVERSITY  
Shillong - 793 001

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AGENDA FOR THE TWENTYEIGHTH MEETING OF THE ACADEMIC COUNCIL

(PART - I)

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Item No. 1      CONFIRMATION OF THE MINUTES OF THE  
                 TWENTYSEVENTH MEETING OF THE ACADEMIC  
                 COUNCIL HELD ON THE 30TH AUGUST, 1986:

The minutes of the 27th meeting of the Academic Council were circulated amongst the members, with a request to give comments, if any, on the same.

Since no comments were received from the members the minutes may be taken as confirmed.

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Item No. 1A      Action taken on the Minutes of the  
27th meeting of the Academic Council -

Cases under Process -

- AC:27:86:03(ii) - Representation in the Governing Body  
of affiliated colleges.
- AC:27:86:03(iii) - Recognition of the Regional Centre  
of Geological Survey of India.
- AC:27:86:05:1(ii) - Regulations on External Research Projects.

- - -

On the recommendation of the Academic Council, the  
Executive Council in its 55th meeting held on 20th March,  
1987, had taken decisions as indicated below :-

EC:55:87:05:2(iv):      "Award of Honours Degree on the  
basis of 5 papers against 8 papers".

As at Annexure- 'A'.

AC:27:86:05:6(i) - Establishment of a School of Spiritual  
and Moral Values -

As at Annexure - 'B'.

AC:27:86:05:6(iii)(a) - Creation of a School of Library  
and Information Sciences.

The Council approved the creation of  
a new School of Library and Information  
Sciences.

AC:27:86:05:6(iii)(b) - Assignment of the Department of  
Economics to the School of Social Sciences -

"The Council reviewed its earlier  
decision in the 45th meeting to assign  
the Department of Economics to the  
School of Economics and Management Studies  
as the School was yet to be established  
and RESOLVED that the Department of  
Economics may remain with the School of  
Social Sciences maintaining the status-quo."

Contd/..

1AL1(2)

AC:27:86:05:6(iv(i) - Grouping of Departments in the  
College of Agriculture -

As at Annexure - 'C'

Follow-up-action has been taken on the remaining  
cases decided by the Academic Council.

Annexure - 'A'

(ii) Award of Honours Degree on the basis  
of 5 papers against 8 papers -

EC:55:87:05:5(ii): The Council thoroughly deliberated upon the matter and resolved to refer the matter to the Academic Council with its recommendation that the pass and honours degree course being conducted by the University at the moment be re-termed as Three-Year Degree course with specific categorisation of First Division, Second Division and Third Division/Simple Pass so as to enable the students to seek admission to the Master's Degree course even if they do not get the requisite 45% aggregate but obtain a Simple Pass. Once the title of the course from Pass and Honours is changed, it will be called Three Year Degree Course and by virtue of its being of three year duration, the candidates will be eligible to seek admission to Master's degree courses at the same time the University will fall in line with the national stream.

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ANNEXURE "B".

- (iv) Report of the Committee on the establishment of a School of spiritual and Moral Values -

EC:55:87:01B(iv): The Council considered the Report of the Committee constituted vide Resolution No. EC:53:86:05:6(ii), and RESOLVED to approve the recommendations as indicated below :

1. To establish a School of Spiritual and Moral Values initially with a Department of Christian Studies and a Departmental of Traditional Religions which is considered relevant and timely. However, the implementation may proceed cautiously.
2. The School should aim at academic studies.
3. In the School, the teachers and other members should be persons of good character with spiritual and moral standing.
4. The University may frame courses and syllabi through an Expert Committee. In so doing, reference may be made to the Mysore University and the Benaras Hindu University where such religious studies have been introduced.
5. The courses may be started initially at the M.Phil level. However, with a view to produce man-power for degree level teaching, the courses at Post-Graduate (M.A.) level may also be started.

It further decided as under :-

The School shall be dedicated to a thorough academic study of Spiritualism and Moral Values.

Spiritualism :- By Spiritualism we imply a belief in the transcendental reality which underlies the structure as well as the time-course of all observable phenomena and which is the origin and repository of all that exists. It gives us a view of Man and Life and Nature. Larger than seeing them as mere pieces of physical matter. It helps us to discover the non-matter as powerful prime-movers in the family of Man. These are love, compassion, sacrifice, brotherhood, tolerance and awareness of beauty. The awareness of this spiritual dimension is the common underpinning of all

religions and brings us all together, in the grand confluence and religio (binding together again). The statements of formal aspects of the rituals in religion which distinguish and stabilise groups are properly the subjects of worthy religious institutions which <sup>alone</sup> are competent for that task and will not be touched upon in the School. The comparative aspects whenever touched upon will not be delivered along with any personal value judgements. That is, it will not be stated that a given religious view is more right or wrong, better or worse than others but all subject will be treated with reverence, as statements of different aspects of transcendental reality which all together make up Man's weltanschauung. The meaning of spiritualism is expressed in relatively modern times by a spiritually oriented writers like Paul (Valery <sup>(1,2)</sup>) as well as a humanists like V Bertrand Russell <sup>(3)</sup>.

Moral Values : The above leads directly not only to a vision of beauty and transcendence of the world evoked by music, dance, poetry and art, in short to esthetic experience, but also leads us to respect for life, for love, for nature, It leads us to right belief, right intention and right conduct, that is ethics. It dissects out for us to what we ought to do, from what we do. In the world of force and destruction and hatred this acquisition is the guiding star and is the common base in Man's nature, upon which our being must come to roost again and again. The School will do well to define these, in all possible ways, by theory, by testimony and by experiment, if possible. Nothing shall be done by the School against the ideal of secularism and national integration as enshrined in the Indian nationhood and the constitution of India. The 'School' as the name implies will give shelter to all views. Beginning will be made by

(a) Christian Studies, (b) Study of Traditional <sup>Religions</sup> ~~Rites~~ of India.

(1) Paul Valery , Variete I, "An sujet d'Adonis", p. 68.

"Il en est de notre esprit comme de notre chair; ce qu'ils se sentent de plus important. ils l' enveloppent de mystere, ils se le cachent eux-memes; ils le designent et le defendent par cette profondeur ou ils le placent. Tout ce qui comte est bien voile; les temoins et les documents l' obscurcissent; les actes et les oeuvres sont faits expressement pour le travestir".

"It is the same with our spirit as with our flesh; both hide in mystery what they feel to be most important. They conceal it from themselves. They single it out and protect it by this pro mundity in which they ensconce it. Everything that really counts is well veiled; testimony and documents only render it the more obscure; deeds and works are designed expressly to misrepresent it.")

(2) Paul Valéry, Monsieur Teste, nouvelle édition, Paris, 1946, pp. 60-61.

"Il y a des personnages qui sentent que leurs sens les séparent du réel, de l'être. Ce sens en eux infecte leurs autres sens.

"Ce que je vois m'avugle. Ce que j'entends m'assourdit. Ce en quoi je sais, cela me rend ignorant. J'ignore en tant et pour autant que je sais. Cette illumination devant moi est un bandeau et recouvre ou une nuit ou une lumière plus ... Plus quoi? Ici le cercle se ferme, de cet étrange renversement; la connaissance, comme une nauge sur l'être; le monde brillant, comme une taie et opacité.

"Otez toute chose que j'y voie."

(There are people who feel that their organs of sense are cutting them off from reality and existence. This feeling then infects all their sense perceptions. What I see blinds me. What I hear makes me deaf. What I know makes me unknowing. In so far and in as much as I know, I am ignorant. This light before me is no more than a kind of blindfold and conceals either a darkness or a light that is more ... More what? Here the circle closes with a strange reversal: knowledge, a cloud obscuring the essence of being; the thinning moon; (by) darkness or a cataract in the eye!).

Take it all away, so that I may see!

(3) Russell, B, 1903, Free Man's Worship and other Essays (London, Unwin Paperbacks, 1976) pp. 9-49.

..... When their (Men's) good and their evil have become sternal by the immortality of the past, be it ours to feel that, where they suffered, where they failed, no deed of ours was the cause, but wherever a spark of the divine fire kindled in their hearts, we were ready with encouragement, with sympathy, with brave words in which high courage glowed.

Brief and powerless is Man's life; on him and all his race the slow, sure doom falls pitiless and dark. Blind to good and evil, reckless of destruction, omnipotent matter rolls on its relentless way; for Man, condemned today to lose his dearest, tomorrow himself to pass through the gate of darkness, it remains only to cherish, ere yet to blow falls, the lofty thoughts that ennoble his little day; disdaining the coward terrors of the slave of fate, to worship at the shrine that his own hands have built; undismayed by the empire of chance, to preserve a mind free from the wanton tyranny that rules his outward life; proudly defiant of the irresistible forces that tolerate, for a moment, his knowledge and his condemnation, to sustain alone, a weary

Item No. 1B MATTERS ARISING OUT OF THE MINUTES :

(i) Grouping of Departments in the College of Agriculture, Medziphema - Report of the Pro-Vice-Chancellor -

EC:55:87:01B (i): The Council deliberated thoroughly on the Report submitted by the Pro-Vice-Chancellor, Nagaland Campus, Kohima, with regard to the grouping of the Departments in the School of Agricultural Sciences & Rural Development, Medziphema and RESOLVED as under :

(i) The Departments be grouped as per the suggestion at 'A' in the Report <sup>(Appendix-A)</sup> and in addition, a 12th Department of Humanities be incorporated and the subjects such as English and other falling in the Department of Humanities be included under the said Department. There should be a Centre for Rural Development within the School. With regard to the other recommendations of the Committee, the Council RESOLVED that the recommendations pertaining to the academic aspects of the School of Agriculture be approved while those pertaining to the administrative aspects such as creation of the post of Deputy Registrar and the administrative arrangements for smooth functioning of the School be placed before the Council in the form of specific Items in the next meeting. For this purpose, the Council authorised the Vice-Chancellor to constitute a Committee which will go into the details on the various aspects recommended by the earlier Committee.

It was further RESOLVED that by discontinuing the academic degree courses, emphasis on basic sciences should not be allowed to be diluted.

Contd/...4..

## Grouping of Departments

(A) <u>Department</u>	<u>Disciplines</u>
1. Agronomy	Agronomy
2. Plant Breeding	Plant Breeding Genetics Botany
3. Entomology	Entomology Zoology
4. Agricultural Engineering	Agril. Engineering Physics Mathematics Meteorology
5. Horticulture	Olericulture Pomology Floriculture Fruit Technology
6. Plant Pathology	Plant Pathology Microbiology Mycology
7. Agricultural Economics	Farm Management Agril. Economics Statistics
8. Animal Science	Animal Husbandry (Dairy, Poultry, Piggery) Veterinary Medicine, Animal Health.
9. Agricultural Extension	Rural Sociology Mass Communication Extension English (and other languages)
10. Soil Science	Soil Science Biochemistry Chemistry
11. Rural Development Planning	Rural Development Planning

. . .

3:1(1)

Item No. 3            RATIFICATION OF ACTION TAKEN BY THE  
VICE-CHANCELLOR :

- (i)            B.D.C. for the students of Geography  
Department, 1984-86 batch -

On the representation of the students of Geography Department of 1984-86 batch and on the recommendation of the local Members of the School Board of Environmental Sciences, the Vice-Chancellor has been pleased to order that subject to the ratification by the Academic Council, the marks secured by the said students in B.D.C. be excluded from the aggregate for determining their percentage and Division. A separate certificate to the effect that the students have offered and passed the B.D.C. is, however, to be issued.

The matter is put up to the Academic Council for ratification of the action taken by the Vice-Chancellor.

- (ii) Nomination of University representatives in the Governing Body of Saiha College, Saiha, Mizoram -

In pursuance of Statute 33(1)(i) and subject to ratification by the Academic Council, the Vice-Chancellor, NEHU, has been pleased to nominate the following teachers to represent in the Governing Body of Saiha College, Saiha, Mizoram, as University representatives, for a period of two years with effect from 12th September, 1986.

1. Dr K.K.Upadhvay, Department of Economics, NBHU, Mizoram Campus, Aizawl.
2. Dr P.C.Wangu, Department of Education, NEHU, Mizoram Campus, Aizawl.

The matter is placed before the Council for ratification of action taken by the Vice-Chancellor.

- (iii) Granting of provisional affiliation to Patkai Christian College, for teaching Honours in Economics -

On the recommendation of the Inspection Committee, the Vice-Chancellor has granted provisional affiliation for teaching Honours in Economics to Patkai Christian College, Chumukedima, Nagaland, for the current academic session, 1986.

Affiliation beyond 1986 will be subject to the fulfilment of conditions as laid down by the Inspection Committee.

The matter is placed before the Council for ratification of the action taken by the Vice-Chancellor.

5:1:1(1)

Item No. 5      ACADEMIC MATTERS :

5:1 - Statutes, Ordinances, Regulations & Rules -

- (i)      Regulation regarding qualification  
         of teachers.

As per the regulation regarding qualification of teachers,  
the qualifications of a Lecturer are as follows:

Lecturer (P.G. Deptt.):

- i) Consistently good academic record with at least high II Class Master's Degree in the relevant subject.
- ii) Doctorate Degree or research work of an equivalent high standard.

Lecturer (College):

- i) A Consistently good academic record with at least 1st or high II Class ( B in the seven point scale) at the Master's Degree in the relevant subject OR an equivalent degree of a foreign University;
- ii) An M.Phil Degree or a recognised degree beyond the Master's level or published work indicating the capacity of a candidate for independent research work.

The various recruitment channels of the University viz: Scrutiny/ Screening Committee, Selection Committee, have recommended applicants who do not possess Ph.D. degree to be called for interview and the Selection Committee have recommended candidates for appointment as Research Associate and in some cases candidates are recommended for the post of Lecturer even though they do not possess the required Ph.D. degree. Perhaps this may be because of good academic record, a good number of years of teaching experience or outstanding research work, publication etc. Instances are there where a candidate is recommended for the post of Lecturer by the Selection Committee and to be re-designated as Reader on obtaining the Ph.D. degree. Under Statute 21 the Executive Council can appoint a person of high academic distinction and professional attainments as Professor or Reader,

Contd/...#-

As per Ordinance of this University the following comprise the Teaching Staff:

- i) Professor
- ii) Reader
- iii) Lecturer

In the recent years, the University, perhaps not finding suitable candidates for Lecturers, to cope with the demand of the Teaching work of various departments, started recruiting Research Associates.

They are appointed under the following conditions :

- 1) Probation period for 2 (two) years.
- 2) required to register for Ph.D. degree within a period of one year of joining
- 3) should complete the Ph.D. course within a period of 8 years and will be redesignated as Lecturer on successful completion of the course
- 4) In the event of not obtaining Ph.D. within the stipulated period the increment may be stopped and the services liable to termination.
- 5) Pay scale :- 700-40-1100-50-1300/-

As per the representation received from the Research Associates of the Pachhunga University College, it was pointed out that the service conditions will be governed by the Act, Statutes and Ordinances of the University from time to time, whereas in fact, the Status of Research Associate is not mentioned anywhere in the Act, Statutes and Ordinances of the University.

Anomalies are there even in the term and condition of appointment. They are put on probation for 2 (two) years and one would naturally expect confirmation after satisfactory completion of their probation period . On the other hand, if they could not complete their Ph.D. within the 8 (eight) years period stipulated, they are liable to termination.

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Therefore, the matter is referred to the Academic Council, the authority competent to lay down the qualification of the teaching Staff, to take a suitable decision as to how they (Research Associates) could be brought within the definition of the regular Teaching Staff.

5:1:2(1)

- (ii) Amendments of Ordinances on Ph.D.  
and M.Phil Programmes -

As the amendments suggested by the School of Physical Sciences on the Ph.D. and M.Phil Programmes have been circulated for comments to different departments, the Deans' Committee suggested that the following resolution may be taken to the forthcoming Academic Council meeting to be held on 27.4.87.

" The Deans' Committee resolved that Ph.D. and M.Phil Programmes be delinked. There is no need for a common course work for Ph.D. Programme. If the Supervisor feels the necessity of any course in connection with the research project assigned to the student, such course should be tailormade and designed as per the need of the research project. "

The matter is placed for consideration of the  
Council

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Item No.5: ACADEMIC MATTERS

5:2 -Syllabus

- (i) Syllabus for M.A. in Public Administration  
(Two-Year Professional Programme) -

The Board of Post-Graduate Studies in Public Administration, which met on the 28th and 29th August, 1986, framed the syllabus for M.A. Course in Public Administration (Two-Year Professional Programme). The syllabus as framed by the Board is placed at Annexure 'A' for consideration and approval of the Council.

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5:2:1(2)

Annexure-'A'

**NORTH-EASTERN HILL UNIVERSITY**

**M.A. PUBLIC ADMINISTRATION**  
**(Two-Year Professional Programme)**

**S Y L L A B U S**

Department of Public Administration  
North-Eastern Hill University  
Mizoram Campus  
Aizawl - 796 007

### 1. PROFESSIONAL PROGRAMME

The foremost consideration in undertaking the formulation of this Two-Year Master's Programme in Public Administration has been to evolve one which is Professionally oriented. A Master's Programme should necessarily aim at building up a level of academic excellence, but, in doing that, professional orientation need not have to be sacrificed; one need not have to preclude the other. A Programme can be structured to promote both academic excellence as well as professionalism.

The conviction which drives us into this is that there is a large Para-governmental sector - consisting, for instance, of such agencies as the industrial and commercial Public undertakings including banks and insurance agencies; local Govt. agencies, both urban as well as rural; cooperatives; universities; and so on - offering a large variety of job avenues for which Public Administration Graduates would be eminently suited but which nothing has been done to exploit as a part of an organised effort. If these agencies were contacted, and Public Administration Programme properly designed to suit their job requirements, numerous job avenues could become available for Public Administration Graduates.

Even within the civil services, there is a vast scope for securing greater accommodation for the discipline of Public Administration in the Public Examinations which are conducted by the Public Service Commissions at the Central and State levels.

There is, however, presently, no organisation, like, for instance, the NASPAA( National Association of Schools of Public Affairs and Administration) in the United States, through which to initiate and establish such contacts with the Prospective employers and Public examination bodies like the PSCs.

Contd/....2/-

Given this, it is left to the initiative of the individual Departments to take a lead in the matter; and what the Department of Public Administration of the NEHU has done in designing this two-year Programme is an attempt in the direction of professionalising the Master's Programme in Public administration. We have, however, no doubt in our mind that this is simply the first step in this direction; a lot more shall be required to be done, and that exercise shall be undertaken as feedback on this initial exercise becomes available to us; and it shall have to be an on-going exercise, we once again have no doubt in our mind on that score.

The Programme we have designed is more a kin in its emphasis and orientation (Please see the Programme structure below) to an M.B.A. Programme-incorporating in its structure a segment of Practical training-rather than a Master's Course, say, in Political science, which is exclusively an academic course. The stint of Practical Training, presently envisaged, has a duration of four weeks; but we are clear in our mind that this will undergo revisions both in content as well as length after we have gained some experience in this sphere. Similarly, Dissertation, which at present figures in the Programme structure as an optional requirement, shall, with a view to reinforcing exposure to the problems of the field, have probably to be accommodated as a compulsory requirement. Likewise, the overall Programme structure shall also undergo changes to make room, for instance, for more optional groups, courses on quantitative and non-quantitative analytical tools, a viva voce examination, and so forth. This revamping may also involve the existing courses in the two-year Programme structure to, for instance, lend more rigour to them.

The Nomenclature: M.A. or M.P.A.

The Two-Year Programme is designated as M.A. (Public Administration). We have opted for this nomenclature to press

to the maximum the advantage of familiarity associated with the phrase "Master of Arts" (M.A.). In view of the fact that it is a Professional Programme, a more suitable designation would have been M.P.A. (Master of Public Administration). In **India**, however, unlike the United States, this nomenclature suffers from a marked disadvantage, that of obscurity. Until such time as the Programme is able to establish its credentials as a Professional Programme (like, for example, the M.B.A. Programme) in the employment market, it might be decisively advantageous to designate it as M.A. (Public Administration). The question of the change of designation might be considered at a later stage.

The present shape and structure of the programme is keyed to the presently available resources of manpower (the Department has a sanctioned strength of five; one Professor, two Readers, two Lecturers) and physical infrastructure. The present shape is also dictated by other environmental constraints and 'norms' as these are understood today. Accordingly, we expect changes to come about with the passage of time as the resources expand and environmental and normative constraints thin out.

The structure of the Programme is indicated below. Other highlights follow subsequently.

## 2. STRUCTURE OF MASTER'S PROGRAMME

### M.A. (Part.I)

#### FIRST SEMESTER:

Course 1 : Fundamentals of Public Administration

Course 2 : Administrative Theory

Course 3 : Bureaucracy and Politics

Course 4 : Indian Administrative System

#### SECOND SEMESTER:

Course 5 : Public Policy Analysis

Course 6 : Development Administration

Course 7 ; Public Personnel Administration

Course 8 : Research Methodology

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PRACTICAL TRAINING ( During the Winter-Break)

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Contd/...

M.A. (Part-I.)

THIRD SEMESTER:

- Course 9 : Economic Administration
- Course 10: Social Administration
- Course 11: Extra- Departmental Course \*
- Course 12: Optional ( to be chosen from the Groups shown below)

FOURTH SEMESTER:

- Course 13: Public Sector Management
- Course 14: Local Self Government in India
- Course 15: Government and Politics of the Hill Areas of North-East India
- Course 16: Optional ( To be chosen from the groups shown below)

Optional Courses :

Furnished below are four groups of optional courses from out of which a student shall choose any one, when she/he enters the second Year of the Programme. Each Group (except Group D) consists of two Optional courses, of which the student concerned shall offer one in the Third Semester and the other in the Fourth. If, therefore, a student, for instance, offers Group A, she/he shall study "Political Theory" in the III semester and "Government and Politics in India" in the IV. The same will hold good with respect to Group B and Group C. Group D relates to Dissertation; this will be in lieu of two courses, and the student concerned shall pursue her/his work on Dissertation during the III and IV Semesters.

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\*In view of the decision of the Academic Council, in its meeting held on the 30th August, 1986, to scrap extra-departmental courses with effect from the Academic Year 1987-88 course 11 shall be replaced by a co course : Comparative Public Administration.

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5:2:1 (7)

The choice of optional group shall thus have to be made at the commencement of the second year (III Semester) of the Programme; once a group is picked up at that stage, the student concerned shall have made her/ his decision concerning both the optional courses or dissertation (as the case may be).

Course

GROUP - A

COURSE A 1 : Political Theory  
COURSE A 2 : Government and Politics in India

GROUP - B

COURSE B 1 : Comparative Business Organisations  
COURSE B 2 : Financial Administration

GROUP - C

COURSE C 1 : Administration for Tribal Development  
COURSE C 2 : Issues in Rural Development

GROUP - D

Dissertation  
( In lieu of two courses)

3. DISSERTATION WRITING

Dissertation writing, at this stage, is being introduced as an optional requirement of the Programme, but eventually, it is thought, it should constitute a compulsory component of the two-year Programme. This students opting for Dissertation shall have a full academic year (III and IV Semesters) available to them to work on it. A compulsory course in Research Methods in the II Semester is designed to impart basic training to students in the steps involved in conduction research. In fact, the Course on Research Methodology was conceived in broader terms than merely as an aid for dissertation - writing; it was thought, it will supply the students with the Knowledge of analytical and research tools which they can put to good use during the stint of Practical Training they shall undergo in the Winter Break.

Contd..6/-

The emphasis on dissertation writing emanates from the stress it is desired to place on the exposure of students to field research and on building up skills of marshalling evidence and report writing. This will lend a critically important dimension to this Two-Year Programme: apart from lending a robust support to the general aim of building up analytical skills, it will particularly assist dental advantage which shall accrue from the exercise of dissertation-rial on the various facets of Public Administration in the North Eastern Region. At least some of these dissertations can be further developed through an M.Phil. or Ph.D. level research and eventually brought out in the form of monographs.

Practical Training (Please see below), coupled with a rigorous exercise in dissertation-writing, will help to ensure that the students, after their two-year training in the Department, have acquired at least some insights in the problems of field research and practical administration and that they have not acquired simply book-knowledge. The students thus trained will be more readily saleable in the competitive employment market. This aspect (building demand for the Public Administration degree holders in the employment market) underscores the need to establish a close report with the Government and other external agencies.

#### 4. PRACTICAL TRAINING

1. Practical Training form an essential component of the Programme structure. It is possible to visualise a wide range of agencies with which to place students for their practical training ; these may include : specific government departments or staff agencies; local government institutions; semi-governmental organisations including industrial and commercial public undertakings, insurance companies, and banks; cooperative societies; and so forth. In fact, private business and commercial enterprises and voluntary organisations may also be considered for this. A detailed exercise will necessary to identify specific organisations and solicit their cooperation in the matter.

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2. This Practical Training shall take place during the winter vacation following the conclusion of the II Semester Examination. It shall be of the duration of four weeks, to begin with.

3. For working out its detailed modus-operandi, a committee consisting of academicians, experts, and the representatives of the organisations whose cooperation in this endeavour we may envisage shall be constituted.

4. The general intention behind a stint of practical training is to expose students to a phase of supervised instruction within an administrative setup, which would help to build up insights that may not be obtained from class-room instruction. The practice of placement will, incidentally, also foster another, unrelated aim, namely, that it will create an invaluable opportunity for the Department to establish a rapport with the prospective employers. Likewise, the latter will also be able to form, through this contact, an idea about the kind of instruction which is imparted to the students under the Master's Programme and its relevance to their (Personnel) requirements. For a new Department, aiming to start a professional Programme, this fallout of the Practical Training Programme shall be of an inestimable value.

##### 5. ELIGIBILITY REQUIREMENTS

The Programme shall be kept open to the Honours Graduates of all the Faculties, much in the same way in which an M.B.A. Programme is. This is Principally based on the consideration that this would be a professional Programme. Apart from that, there is another consideration of a practical nature involved here, namely, that Public Administration is not taught at the Under-Graduate level in this Region. As such unless admission in the Programme is thrown open to the Graduates of all Faculties, there will be a severe constraint on students-enrolment; this could be a fatal handicap. As far as the Political Science Honours Graduates are concerned, a large majority of them, planning post-Graduate studies, it looks reasonable to assume, would like to opt for a post-Graduate Degree in Political Science rather than Public Administration. Therefore, keeping the M.A. Programme open to the Graduates of all faculties is a vital necessity; the future of the programme shall hinge directly upon this decision.

6. RELATIONS WITH GOVERNMENT AND  
OTHER EXTERNAL AGENCIES

1. Close contacts and consultations with the Government and Other Agencies shall be of essence in order that the aims of the Programm may be realised in their entirety. Apart from the informal channels which might be utilised for the purpose, it is vital to establish certain institutional arrangements as well. The appointment of a Placement-Officer, who would liaise with the outside agencies in regard to the Practical Training requirements, may be one kind of standing arrangement. We, however, necessarily have to go beyond this and consider the possibilities of liaising with the outside agencies at fairly senior levels. For this, the creation of a forum in which the University, the Department, and the Government and other external agencies are represented at senior levels might be considered. This may be in the nature of an Advisory-Cum-Evaluation Board which will meet periodically to perform its functions of advice and evaluation. A relationship with the outside world at this level alone promises the delivery of the goods we seek.

2. At the level of the Department, of course, we visualise two other methods (besides the appointment of the Placement-Officer) to foster closer ties with the external agencies. The first of these is the practice of guest-speakers from within the Government and other agencies. These guest-speakers might either be invited for special lectures, or, at least some of these persons from outside the Department, may, in fact, be associated with the departmental teaching on a part-time basis. The second method may be various kinds of projects under the joint auspices of the Department and the Government and other agencies. These might be research projects; publications (including a Journal); projects involving development of reading materials on, say, some specific aspects of Administration in the North-Eastern Region; and joint projects for preparing case studies.

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3. The establishment of the IIPA's Local Branch in Aizawl can also serve as a forum to promote interaction and cooperation with Government, para-govt. and other agencies. (It has already been established at the Department's initiative). In fact, some of the above-noted Projects can be launched under the joint auspices of the Department and the Local Branch of the IIPA

C O U R S E - 1

FUNDAMENTALS OF PUBLIC ADMINISTRATION

1. What is Public Administration ?
  - (A) Nature and Scope of Public Administration;
  - (B) The Role of three Branches; Forms of Government;
  - (C) Politics and Administration ;
  - (D) Policy and Administration :
  - (E) Private and Public Administration ;
  - (F) Management and Administration ;
  - (G) Public Administration and Development Administration;
  - (H) Public Administration and Comparative Public Administration;
  - (I) Public Administration and Public Enterprise;
  - (J) Public Administration and Bureaucracy;
2. Public Administration as a Social Science; Development of the Discipline of Public Administration; Contemporary Approaches to the Study of Public Administration: Behavioural, Systems, and Structured-Functional Approaches; New Public Administration.
3. Administrative Organisation :
  - (a) Mechanistic and Humanistic Conceptions of Organisation: Concepts of Formal and Informal Organisation.

- (b) Structure of organisation: Concepts of Line and Staff Agencies.
  - (c) Forms of Organisation: Department; Public Corporation; Independent Regulatory Commission.
  - (d) Centralisation, Decentralisation, and Delegation.
  - (e) Headquarters and Field Agencies.
4. Administrative Process:
- (a) Decision-making
  - (b) Communication
  - (c) Leadership
5. Management Aids and Public Administration
- (a) Budgeting process
  - (c) Personnel process
6. Accountability of Public Administration

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C O U R S E - 2

ADMINISTRATIVE THEORY

1. Theory and Administration
2. Classical Theory
3. Scientific Management School
4. Human Relations Movement

Contd/...

5. Decisional Theory
6. Systems School
7. Administrative Ecology
8. Theory of Development Administration
9. Organisation Humanism

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C O U R S E - 3

BUREAUCRACY AND POLITICS

1. What is Bureaucracy ? Its nature and importance.
2. Classical Theories of Bureaucracy: Max Weber, Karl Marx, and Robert Michels.
3. Post- Weberian Theories of Bureaucracy: Robert Merton, Philip Selznick, and Alvin Gouldner.
4. Bureaucracy in the Third World.
5. Behavioural Climate and Theories of Organisational Behaviour.
6. Bureaucracy and Politics: A Comparative Perspective (with reference to): India, Britain, U.S.A., and U.S.S.R.

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4. S. Avineri. The Social and Political Thought of Karl Marx, Cambridge University Press, 1970.
5. Robert Michels, Political Parties: A Sociological Study of Oligarchical Tendencies of Modern Democracy, N.Y., Dover Publications, 1915.
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C O U R S E -4

INDIAN ADMINISTRATIVE SYSTEM

1. Indian Administration during British Rule and in its contemporary context (A synoptic view).
2. Framework :  
Salient Features of the Constitution; Parliamentary Democracy; Federal System; Political Executive: President, Prime Minister, Council of Minister, Cabinet; Cabinet Secretariat.
3. Secretariat; Ministries and Departments; Attached Offices & Subordinate offices; Procedures of work.
4. Role of constitutional Agencies and Extra-Departmental Bodies.
5. Administration at the state level : Political Executive ; State Secretariat; Board of Revenue.
6. Administration at the District level: District as a unit of Administration; Role of District Collector District Administration Hierarchy.

Contd/...

7. Some Issues :

Ministor - Secretary Relationship;  
Secretary - Director Relationship;  
Union - State Relations : Financial, Administrative.  
and Legislative;  
Administrative Reforms;  
Accountability.

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4. Indian Journal of Political Science (Journal of the Indian Political Science Association.)
5. Political Science Review (Journal of the Department of Political Science, University of Rajasthan, Jaipur.)

C O U R S E - 5

PUBLIC POLICY ANALYSIS

1. Concepts of Policy, Public Policy, and Policy science.
2. Identifying and Defining Public Policy Making Problem.
3. Analysis, Power, and Partisan Analysis in Public Policy Making.
4. Normative Models of Public Policy Making.
5. Role of Bureaucry in Public Policy Making.
6. Administrative Policy Making.
7. Issues in Policy Implementation :
  - (a) Field Organisation; Headquarters-Field Relationship.
  - (b) Decentralisation and Delegation.
8. Public Policy-Making in India (One Case Study)

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C O U R S E -6

DEVELOPMENT ADMINISTRATION

1. Concept, Importance, and Scope of Development Administration. Evolution of the Theory of Development Administration Public Administration and Development Administration. Development Non-Developmental Dichotomy.
2. Concept of Administrative Development.

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3. Concepts of Development and Modernisation.  
Concepts of Economic Development, Political Development;  
and Social Change.
4. Features of Public Administration in Developing Countries,  
Orienting Pub. Admn. to handle development: Two Challenges:  
(i) Evolving new organisational forms, and  
(ii) Reorienting Bureaucracy. In the remaining Course these  
aspects shall be studied.
5. Organisation for Development (Search for new forms)  
Planning Machinery : Why Commission - or Board Type of  
Organisation ? (A Survey of Planning Machinery in India  
at Central and State Levels.)  
Forms of Organisation for Public Enterprise Management :  
Why search is made for 'new' (extra-departmental) forms  
of organisation ?  
What these forms are ? (A survey of organisational patterns  
of Public Enterprise with reference to India.)  
Co- and Area Development and Integrated Rural Development:  
Their purpose and organisational setup.  
Democratic Decentralisation (A Strategy of Development through  
participation): The pattern of Panchayati Raj Institutions:  
NES and Community Development Blocks.
6. BUREAUCRACY AND DEVELOPMENT  
Characteristic Features of Bureaucracy in developing countries.  
Role of Bureaucracy in Development.  
How to Prepare Bureaucracy for developmental tasks ?  
What it involves ?

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9. S.K. Sharma, Ed., Dynamics of Development (Two Volumes), New Delhi, concept Pub. House.
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1. V.A. Pai Eknandiker, "Development Administration: An Approach," IJPA, Vol. X, 1964, pp.34-43.
2. W. Wood, "Development Administration : An Objection ", IJPA, Vol. XIII, 1967, pp. 702-15.
3. D.P. Dwivedi and J. Nef, "Development Theory: A Fence Around an Empty Lot," IJPA. (Vol. & No. to be identified).
4. D.P. Dwivedi and J. Nef, " Crisis and continuities in the Theory of Development, " Public Administration and Development. (Vol & No. to be identified.)

JOURNALS

1. Journal of Social and Economic Studies. (SAGE Publication India Pvt. Ltd., P.O. Box 4215, New Delhi - 110048.)
2. Indian Journal of Public Administration. (Journal of the Indian Institute of Public Administration, New Delhi - 110002.

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COURSE - 7

PUBLIC PERSONNEL ADMINISTRATION

1. Nature and concept of Public Personnel Administration.
2. Study of India Public Personnel System with reference to:
  - (a) Organs responsible for Personnel Management .
  - (b) Union Public Service Commission.
  - (c) Structure of civil service .
  - (d) Recruitment, classification, training, and promotion practices in respect of higher civil services.
  - (e) Salary Administration.
  - (f) Political Rights and Rights to organise and strike of civil servants.
  - (g) Conditions of service.
  - (h) Conduct Rules, Disciplinary Action, Removal, and Appeals.
  - (i) Machinery for Redressal of civil service grievances.
3. Recruitment, Classification and Training of civil services in U.K. U.S.A. and France

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2. Felix A. Nigro, Public Personnel Administration.
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9. ARC, Report on Personnel Administration, Delhi, The  
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10. V.A.Pai Panandikar, Personnel Administration- Implementing  
the Reforms, New Delhi, IIFA, 1970.
11. Martin Albrow, Bureaucracy, London, Pall Mall Press, 1970.
12. Nicos P. Mouzelis, Organisation and Bureaucracy, London  
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15. R.D.Jain, (Ed), Contemporary Issues in Indian Administration,  
New Delhi, Vishal.
16. K. Doshi, et.al., Management in Government, New Delhi,  
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17. Herman Finer, Theory and Practice of Modern Governments,  
E.N.Gladden, British Civil Service.
18. Mackenzie and Grove, Central Administration in Britain.
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Concept Pub. Co., 1976.
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2. R.S. Davar, Personnel Management and Industrial Relations, (2nd edn) Bombay, Vikas, 1981.
3. P.C. Tripathi, Personnel Management, New Delhi, S. Chand & Sons, 1980.
4. P. Bigers & C.A. Myers, Personnel Administration - A Point of Views and method, McGraw Hill. (latest edn.)
5. J.D. Minor, Personnel and Industrial Relations - A Managerial Approach, New York, Macmillan. (latest edn.)
6. R.D. Agarwal, (Ed), Dynamics of Personnel Management in India: A Book of Readings, Bombay, Tata McGraw Hill  
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7. A R C. Study Team, Report on Recruitment Policies, Selection Procedures, UPSC/SPSC & Training (S.P.F. Therat), Delhi, The Manager of Publications.
8. A R C Study Team, Report on Promotion Policies, Conduct Rules, Disciplines and Morale (K.N. Nagarkatti), Delhi  
The Manager of Publications.

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COURSE - 8

RESEARCH METHODOLOGY

1. Scientific Method.: Its meaning and basic elements.
2. Steps in formulation of a research design: The role of hypothesis formulation.
3. Methods of collecting data: Use of historical data; field observation; survey method; questionnaires and schedules interview as a tool; case study method.
4. Elementary statistical concepts and techniques: Statistical units, variables; frequency distribution; measures of central tendency (mean, median and mode); variability-measures of variability (range, mean deviation, standard deviation and semi-interquatile range); sampling procedures.

SUGGESTED READINGS

CORE READINGS:

1. F.N.Kerlinger, Foundations of Behavioural research, New York, Holt, Rinehart and Winston, 1967.
2. Pauline V.Young, (4th edn.) Scientific Social Surveys and Research, New Delhi, Prentice Hall of India, 1960. (Third Indian reprint of the original U.S. edition published by Prentice Hall).
3. W.J.Goode and F.F. Hatt, Methods in Social Research, New York, McGraw Hill, 1952.
4. Claire Selitiz, et.al., Research methods in Social relations, N.Y. Holt, Rinehart & Winston, 1965.
5. Croxton and Cowden, Applied General Statistics.
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2. Norman Delansku, Ed., Social Work Research, Chicago, University of Chicago Press, 1960.
3. John Galtung, Theory and Methods of Social Research, London, Allen & Unwin, 1970.
4. A.M.Goon, et. al., Fundamentals of Statistics ( Vols. 1 & 2), Calcutta, The World Press Pvt. Ltd.
5. F.G. Hoel and R.J.Jessen, Basic Statistics for Business and Economics, N.Y. John Wiley & Sons.
6. R.B.Jain, Research Methods in Public Administration, IJPS (Vol. & issues to be identified).
7. Indian Journal of Law, The Journal Indian Law Institute (special issue on research methodology), 1984.

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5:2:1 (37)

COURSE - 9

ECONOMIC ADMINISTRATION

1. Introduction
  - A. What is Economic Administration ? Evolution, Nature, Scope and Techniques of Economic Administration.
  - B. Role of Government in Economic Development.
  - C. Strategy of Economic Development in India : Role of Mixed Economy.
2. Indirect Intervention -
  - A. Framework of Indirect Intervention in India.
  - B. Regulation and Promotion of Industry and Agriculture in India.
3. Direct Intervention -
  - A. Nature and Concept of Public Enterprise.
  - B. Status and Role of Public Enterprise in Indian Economy.
  - C. Organisational Patterns of Public Enterprise with reference to India: Department, Modifications in Departmental Structure, Public Corporation, Government Company.
4. Economic Planning -
  - A. Evolution and Concept
  - B. Planning Machinery in India.
  - C. Planning process at the Central level in India : Plan formulation, implementation and financing.
  - D. Problems of Plan implementation in India.

SUGGESTED READINGS

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1. D. D. Brij Singh, Economic Development, Vikas (latest edn.)
2. Clair Wilcox, Public Policies Toward Business.
3. B.C. Tandon, Economic Planning : Theory and Practice, Allahabad, Chaitanya Pub. House, (Latest edn.)

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5. A. Dasgupta and N.K. Sengupta, Government and Business in India, Allied Book Agency, 1970.
6. A.H. Hanson, Public Enterprise and Economic Development, London, Routledge & Kegan Paul, 1962.
7. S.C. Kuchhal, The Industrial Economy of India, Allahabad, Chaitanya Pub. House, (Latest Edn.)
8. C.B. Memoria, Organisation and Financing of Industries in India, Kitab Mahal, (Latest Edn.)
9. Laxmi Narain, Principles and Practice of Public Enterprise Management, New Delhi, S. Chand & Sons, 1900.
10. W.A. Robson, Nationalised Industry and Public Ownership, (2nd Edn.), London, Allen & Unwin, 1962.
11. V.V. Ramaswami, (Ed.), The Nature of Public Enterprise, London, Croom Helm, 1984.
12. Om Prakash, Theory and Working of State Corporations, (2nd Ed.), New Delhi, Orient Longman, 1971.
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15. A.H. Hanson, The Process of Planning, Oxford University Press, 1966.
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1. Edward S. Mason, Economic Planning in Under Developed Areas, New York, Fordham University Press, 1961.
2. G.M. Meier and R.E. Baldwin, Economic Development, N.Y., Willey, 1957.
3. W.G. Friedmann, State and the Rule of Law in a Mixed Economy, Stevens, 1971.
4. A.H. Hanson, Parliamented Public Ownership, Connecticut, Greenwood Press, 1973. (Originally Published by London, Cassell, 1961.)
5. R.S. Arora, Administration of Government Industries, New Delhi, Indian Institute of Public Administration.
6. Leonard Tivey, Nationalisation in British Industry, (2nd Edn.), London, Jonathan Cape, 1973.
7. Leonard Tivey, (Ed.), The Nationalised Industries Since 1960, London, Allen & Unwin, 1973.
8. W. Friedmann & J.F. Garner, (Eds.), Government Enterprise A Comparative Study, New York, Columbia University Press 1970.
9. S.E. Thomas, Commerce : Its Theory and Practice, London Cassell.
10. J.L. Hanson, The Structure of Modern Commerce, (6th Ed.), London, Macdonald & Evans, 1979.
11. R.B. Jain, "Planning System in Developing Countries, "IJPA, 1984.

C O U R S E - 10

SOCIAL ADMINISTRATION

1. Concept, Nature, and Scope of Social Administration.

Contd/.../-

2. Organisation for Social Administration at Central, State, and Local Levels :
  - (A) Central Department of Social Welfare; Case for creation of an integrated Ministry for Social Affairs; Central Social Welfare Board - Its Composition, Functions and Status.
  - (B) The State Level Departments/Directorates of Social Welfare; Controversy regarding their roles; the State Level Social Welfare Board.
  - (C) Social Administration at District, Block, and Village Levels.
3. Methods of Social Administration (Social Work Process): Social Casework, Social Group Work, Community Organisation.
4. Role of Voluntary Agencies and their Relationship with Government.
5. Post-Independence Social Legislation in India.
6. Social Planning in India- Social Development Sector under the Five Year Plans.

SUGGESTED READINGS

CORE READINGS

1. David C. Marsh, (Ed.), An Introduction to Social Administration, London, Routledge & Kegan Paul.
2. G.B. Sharma, Social Administration in India, Jaipur, Unique Traders, 1970.
3. Walter A. Friedlander, Introduction to Social Welfare, New Delhi, Prentice Hall of India, 1967.
4. V. Jagannadham, Social Welfare Organisation, New Delhi, IIPA.
5. T.N. Chaturvedi & S. Kohli- Chandra, (Eds), Social Administration : Development and Change, New Delhi, IIPA.

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6. D.Paul Chowdhry, Social Welfare Administration, Delhi Atma Ram & Sons, 1979.
7. D.Paul Chowdhry, Social Welfare Administration Through Voluntary Agencies, Delhi, Atma Ram, 1980.
8. Planning Commission, Social Welfare in India, New Delhi, Planning Commission, 1955.
9. R.N. Saksena, Sociology and Social Policy in India, Calcutta, Orient Longman.
10. Planning Commission, Social Legislation : Its role in Social Welfare Planning, New Delhi, 1959.
11. R.N. Titmus, Essays on Welfare State.
12. S.K. Khinduka, Social Work in India.
13. Planning Commission, VII Plan Document, New Delhi, 1986.

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1. T.N. Chaturvedi, Ed., Administration For Child Welfare, New Delhi, IIPA. (Indian Institute of Public Administration).
2. T.N. Chaturvedi, Ed., Administration for the Disabled, New Delhi, IIPA.
3. V. Jagannadham & M . Bhattacharya, Integrated Delivery System for Social Services, New Delhi, IIPA.
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6. H.H. Stroup, Social Work : An Introduction to the Field. N.Y. American Book, 1960.
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8. Arthur Hillman, Community Organisation and Planning, N. Y., Macmillan, 1950.

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C O U R S E - 1 3

PUBLIC SECTOR MANAGEMENT

This will be an issue-oriented course. Principal issues from within the areas indicated hereunder shall be picked up and projected, after the basic contents of each topic have been laid bare. Issues shall be identified and discussed with reference to public sector management in India.

1. Organisation for Public Enterprises :
  - (A) Concept of Corporate enterprise :
  - (B) Organisational Patterns of Public enterprise :
    - (i) Departmental Undertaking ;
    - (ii) Semi-autonomous Public Enterprise (e.g., Railway Board, P & T Board);
    - (iii) Control Board);
    - (iv) Statutory Corporation ; and
    - (v) Government Company.

( consider Indian Experience and Dwell on the question of suitability.)

2. Internal Management Structure of Public Enterprises :
  - (A) Board of Directors: Its position, types, role and functions, and composition. (Draw on issues from Indian Scene.)
  - (B) Managing Director : His position and Role in the structure of a Public enterprise. (Draw on issues from Indian Scene.)
  - (C) Minister, Board, and Managing Director Relationship- Its dynamics with reference to the concepts (and functions) of Policy Formulation, Sub-Policy making, and Day to Day Administration. (consider Analytical Distinctions and Indian Experience.)

Contd/.../-

3. Control of Public Enterprises :
  - (A) Concepts of Control, Accountability, and Autonomy,
  - (B) Governmental, Parliamentary, and Audit control of public enterprises.
  - (C) Accountability : Autonomy Question.
4. Personnel Management with reference to the recruitment and training of managerial personnel.
5. Managerial Compensation.
6. Labour Participation in Management.
7. Profit and Price Policies of Public Enterprises in India.

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CORE READINGS

1. L.A. Keith and C.E. Gubellini, Introduction to Business Enterprise, N.Y., McGraw-Hill, 1967
2. S.E. Thomas, Commerce : Its Theory and Practice, 9th Ed., London, Cassell, 1973.
3. J.L. Hanson, The Structure of Modern Commerce, 6th Edn., London, Macdonald & Evans, 1979.
4. R.S. Arora, Administration of Government Industries, New Delhi, IIPA, 1969.
5. Om Prakash, Theory and Working of State Corporations, 2nd Edn., New Delhi, Orient Longman, 1971.
6. S.S. Khehra, Government in Business, New Delhi, National, 1979.
7. N.N. Mallya, Public Enterprises in India : Their Control and Accountability, National, 1971.
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11. A.H.Hansen, *Parliament and Public Ownership*, Connecticut Greenwood Press, 1973 (Originally published by London Cassell, 1961).
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23. Laxmi Narain, *Parliament and Public Enterprises in India*, New Delhi, S. Chand & Sons, 1979.

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2. T.H.Burnham & G.O.Hoskins, Elements of Industrial Organisation, 8th ed., Pitman, 1971.
3. Morris E Hurley, Business Administration, 2nd ed., New Delhi, Prentice Hall of India, 1968. (Indian reprint of the original U.S. edition by Prentice Hall of USA).
4. D.S.Kimball and D.S.Kimball, Principles of Industrial Organisation, Bombay, Vakils, Feffer & Simsons, 1971. (Indian reprint of 6th McGraw-Hill, edn).
5. Avtar Singh, Company Law, 7th ed., Lucknow, Eastern Book Co., 1982.
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14. V. Kolesov, The Public Sector, New Delhi, Sterling Publishers, 1980.
15. B.P.Mathur, Public Enterprises in Perspective, New Delhi Orient Longman, 1973.
16. Waris R Kidwai, (ed), Public Sector: An Interinspection, New Delhi, Standing Conference of Public Enterprises (SCOPE), 1980.
17. Fraxy Fernandes & Vladimir Krencio, A Case Book of Public Enterprise Studies, Ljubljana (Yugoslavia), ICPE, 1962.

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COURSE : 14

LOCAL SELF GOVERNMENT IN INDIA

1. Meaning of Local Self Government; Essential features, scope and importance of Local Self Government.
2. Decentralisation, Democracy and Development.
3. Organisation and Functions of Municipalities/Municipal Corporations, Municipal personnel, municipal finance; municipal politics; committee system, state control over the Municipal Administration; Problems of Urban Development.
4. Concept of Panchayati Raj; Organisation and working of the Three-Tier P.R. Institutions:  
The Gram Panchayat, the Panchayat Samiti, The Zila Parishad.
5. Political Parties and pressure politics in Panchayati Raj administration; Official and non-official relationship; State control over P.R. Institutions.
6. Functions and working of community development Blocks with special reference to Meghalaya, Nagaland and Mizoram.

SUGGESTED READINGS:

CORE READINGS:

1. S.R. Maheshwari, Local Government in India, New Delhi, Orient Longman, 1976.
2. A. Avanthi, (ed). Municipal Government and Administration in India, Agra, Laxmi Narain and Co., 1972.
3. R. Argal, Municipal Government in India, Allahabad, 1955.
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5. N. Bhattacharya, State-Municipal Relations, New Delhi, IIPA.
6. State Machinery for Municipal Supervision, New Delhi, IIPA.
7. Hoshier Singh, State Supervision over Municipal Administration: A Case Study of Rajasthan, New Delhi, Associated Publishing House, 1980.
8. Haldipur and Parmahansa, (ed), Local Government Institution in Rural India.
9. G. Ram Reddy, Panchayati Raj in India.
10. R.V. Jathar, Evolution of Panchayati Raj, Dharwar, 1965.

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11. R.B.Jain, (ed), Panchayati Raj, New Delhi, IIPA.
12. Iqbal Narain, et.al., Panchayati Raj Administration, New Delhi, IIPA.
13. S. Bhatnagar, Rural Local Government in India, New Delhi, Light and Life, 1980.
14. S.C.Jain, Community Development and Panchayati Raj, .
15. M.A.Muyyalib and Mohammad Akbar Alikhian, Theory of Local Government.
16. S.R.Nigan, Local Self Government, Delhi, S.Chand & Co.
17. Henry Maddick, Development, Decentralisation and Democracy.
18. High Tinker, The Foundation of Local Self Government in India, Pakistan and Burma, London, 1954.
19. V.V.Rao & Niru Hazarika, Local Government in India, New Delhi, S.Chand & Co., 1983.

## ADDITIONAL READINGS:

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2. Rodney Jones, Urban Politics in India, Delhi, Vikas.
3. Municipal Personnel System, New Delhi, IIPA.
4. M.Bhattacharya, Essays in Urban Government, Calcutta, World Press.
5. M.Bhattacharya, Municipal Government: Problems and Prospects, Delhi, Research, 1975.
6. D.C.Petter, Government in Rural India.
7. S.K.Sharma and V.N.Chawla, (ed), Municipal Administration: Some Reflections. Jullundur, International, 1975.
8. S.C.Dube, The Village Level Workers: Their work and result demonstration.
9. S.N.Mishra, Politics and Leadership in Municipal Government, New Delhi, Inter India Pub., 1979.
10. Chetakar Jha, Indian Local Self Government, Patna, 1958.
11. S.K.Dey, Community Development through Panchayati Raj, New Delhi, 1964.
12. Harold F. Alderfer, Local Government in developing countries, London, 1964.

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13. E.H.Valsan, Community development programmes and Rural Local Government: Comparative case study of India and Philippines, New York, Praeger, 1970.
14. K.M.Rastogi, Local Finance: Its theory and working in India, Gwalior, Kailash Pustak Sad 1967.
15. Chetkar Jha, Local Government by Committees, Patna, Novelty, 1963.
16. Ali Ashraf, Government and Politics of big cities: An Indian Case study, Delhi, Concept Pub. Co., 1970.
17. N.B.Rangnekar and N.D.Rajachyaksha, (ed), Problems of Municipal Administration, Bombay, All India Institute of Local Self Government, 1970.
18. Aditya Prasad Padhi (ed), Personnel Systems of Urban Bodies in India, Agra, Lakshmi Narain, 1977.

COURSE - 15

GOVERNMENT AND POLITICS OF THE HILL AREAS  
OF NORTH EAST INDIA

1. British Annexation: British Rule and its impact on the Hill Areas with special emphasis on Administrative, Political and economic aspects.
2. District administration of the Hill Areas of North-East India: Pre and Post-Independence period: British superintendent/Deputy Commissioner: His power and position; His role in development administration in the District.
3. The Inner Line Regulation and its relevance in the present socio-economic context.
4. Administration of Justice in the Hill Areas and its relevance in socio-economic change process.
5. Constitutional framework for the administration of the Hill Areas of North-East India: The Sixth Schedule: District/Regional Councils: Organisation, Powers (Legislative/Executive/Financial/Judicial) and working; Council's relation with the State Government.

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6. Rural Administrative Institutions:  
Traditional Village Institutions/Village Councils:  
Composition, Powers and Working.
7. Political Institutions in North-East India: The Nature of  
Party system; Ideology and Politics of major Nations;  
Regional Political Parties; Pressure groups; Regional  
Politics.
8. Emergence of Class - Middle Class, Land and Land-relations.
9. North Eastern Council: Its organisation and role.

## SUGGESTED READINGS

## CORE READINGS:

1. E.A.Gait, History of Assam, Calcutta, Thacker Spink, 1963.
2. A.G. MC Call, Lushai Crystals, London, Luzac and Co., Ltd.,  
1949
3. J. Shakespeare, Lushai-Kuki Clans, London, Macmillan and  
Co., Ltd., 1942.
4. Neera Chatterjee, The Mizo Chief and his Administration,  
Aizawl, Tribal Research Institute.
5. N.E. Parry, The Lakhers, Aizawl, Tribal Research Institute.
6. V.V. Rao, A Century of Tribal Politics in North-East  
India, New Delhi, S. Chand & Co.
7. S.K. Chaube, Hill Politics in North-East India, Calcutta,  
Orient Longman, 1973.
8. M. Horam, Naga Polity, Delhi, D.K. Publishers.
9. Chandrika Singh, Political Evolution of Nagaland,  
Delhi, Lancers, 1981.
10. S.K. Singh, Ed., Tribal Situation in India, Simla, Indian  
Institute of Advanced Studies, 1972.
11. S.C. Dube, Tribal Heritage of India, New Delhi, Vikas, 1977.
12. L.P. Vidharthi and B.K. Rai, The Tribal Culture of India,  
Delhi, concept, 1977.
13. G.V.F Haimendorff: Nagas, Calcutta, Thacker Spink, 1969.
14. P.R.T. Gordon, The Khasis, Gauhati, United Publishers, 1975.
15. A. Playfair, The Garos, Gauhati, United Publishers, 1975.

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16. V.V.Rao & Niru Hazarika, A Century of Government and Politics in North-East India, New Delhi, S.Chand & Co., Vol. I (Assam), Vol. II (Meghalaya), Vol. III (Mizoram). Vol. III forthcoming).
17. Durga Das Basu, Introduction to the Constitution of India, Delhi, Prentice Hall of India, 1985.

ADDITIONAL READINGS:

1. Political History of Assam, 3 Vols., Dispur, Government of Assam, 1977, 1978, 1980 respectively.
2. A. Mackenzie, History of the Relations with the Hill Tribes of the North-East Frontier of Bengal, 1884; Reprint as The North East Frontier of India, Delhi, Mittal Publications, 1979.
3. S.M.Dubey, (ed.), North Eastern India: A Sociological Study, Delhi Concept Pub. Co., 1978.
4. Animesh Ray, Mizoram: Dynamics of Change, Calcutta, Pearl Publishers, 1982.
5. Hamlet Barch, The History and Culture of the Khasi People, Calcutta, 1967.
6. Hamlet Barch, Khasi Democracy.
7. S.K.Chattopadhyay, Tribal Institutions of Meghalaya, Gauhati, Spectrum Publications, 1985.
8. Yogesh Atal, Local Communities and National Politics, Delhi, National Publishing House, 1971.
9. A Brief Historical Account of Nagaland, Kohima, Institute of Culture, 1967.
10. V. Elwin, Democracy in NEFA, Shillong, NEFA, 1965.
11. M.L.Bose, Historical and Constitutional Documents of North Eastern India, Delhi, Concept Publishing Co., 1978.
12. Report of the Commission on the Hill Areas of Assam,
13. Report of the North East Frontier (Assam) Tribal and Excluded Areas Sub-Committee, 1947, 2 vols., Delhi, The Manager of Publications, 1950.

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14. Constituent Assembly Debates, Vol. IX. No. 29, September 16, 1949, and Vol. X, No. 27, September, 1949.
15. Bengal Eastern Frontier Regulation, 1873 (27th August, 1873).
16. North Eastern Areas (Reorganisation) Act, 1971.
17. N.E.Parry, A Monograph on Lushai Customs and Ceremonies, Aizawl Tribal Research Institute.

ARTICLES:

1. B. Pakem, The Changing Power structure of the political institution of Chieftainship in Mizoram. (IN) The Journal of the North East India Council for Social Science Research, Vol. V. No. II, Shillong, 1984.
2. R.N.Prasad, District Council: Composition, Powers, Functions and Working (IN) Elements of Indian Constitution, Shillong, North Eastern Hill University Publications, 1985.
3. R.N. Prasad, A Study of Village Administration in Mizoram (IN) The Indian Journal of Public Administration, October-December, 1983.
4. Soumen San, Regionalism in the North-East and the Regional Parties of Meghalaya (IN) Interdisciplinary, Vol. 15, No. 2.

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5:2:1(52)

COURSE - A 1 (Optional)

POLITICAL THEORY

The Course will broadly cover the following :

1. Why Political Theory? Politics and Political Theory; Major Traditions of Political Theory.
2. Approaches to the study of Political Theory: Behavioural approach, structural-functional approach, Systems Analysis, Marxist approach.
- 3A Major Concepts: Sovereignty, Liberty, Rights and Duties.
- 3B Major Concepts : Political obligation, political socialisation, political culture, revolution.
4. Political Development : Modernisation, Nation building and its problems.
5. Pluralism, Liberalism, Individualism, Idealism, Syndicalism, Guild Socialism, Fabianism, Socialism and Marxism.

#### SUGGESTED READINGS

##### CORE READINGS:

1. G.H.Sabine, History of Political Theory, London, 1949.
2. S.P.Verma, Modern Political Theory, Delhi, Vikas, 1975.
3. C.James, Charlesworth, (ed), Contemporary Political Analysis, New York, 1967.
4. Robert Dahl, Modern Political Analysis, New Delhi, 1967.
5. David Easton, The Political System.
6. J. Flamenatz, Consent, Freedom and Political Obligation.
7. V.I. Lenin, State and Revolution.
8. C.L.Wapper, Political Thought, London, 1973.
9. F.W.Coker, Recent Political Thought, New York, 1934.
10. Mulford, Q Sibley, Political Ideas and Ideologies: History of Political Thought, New York, Harper and Row, 1970.
11. E.K.Hunt, Property and Prophets: The Evolution of Economic Institutions and Ideologies, New York, Harper and Row, 1970.

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12. Andres Hacker, Political Theory: Philosophy, ideology, and Science, New York, 1961.
13. M.N. Roy, Parties, Politics and Power, Calcutta, 1960
14. Stephen Wasby, Political Science; The Discipline and its dimensions, Calcutta, Scientific Book Agency, 1972.
15. Almond and Powell, Comparative Politics : A developmental Approach.
16. Lucian W. Fye, Aspects of Political Development, New Delhi, Amerind Pub. Co. (Indian Edition, 1972.)  
(Originally Published in USA by Little, Brown & Co.)
17. C.M. Joad, Political Theory, London, Frank Cass.
18. Prinstine, Modern Isms.

ADDITIONAL READINGS

1. Davies, Modern Revolutions.
2. Gester, Jones and Lancaster, Masters of Political Thought, Vols. I,II and III, London, George Harper, 1959.
3. Herbert Marcuse, Reason and Revolution; Hegel and the rise of Social Theory, London, Routledge and Kegan Paul 1955.
4. W.T. Blum, Theories of Political System.
5. D. R. Bhandari, History of European Political Philosophy Bangalore, The Bangalore Printing and Publications, 1970.
6. V.V. Rao, History of Political Theories, Delhi, S. Chand and Co., 1980.
7. P. Chatterjee, The State of Political Theory, Calcutta, K.F. Bagchi and Co., 1978.
8. Ralph Miliband, Marxism and Politics, London, Oxford University Press, 1977.

9. Robin Blackburn, Revolution and Class Struggle, London Fantana, 1977.
10. R.L. Gupta, Political Theory, Delhi, Sultan Chand & Co, 1982.
11. C. Pateman, The Problem of Political Obligation : A Critical Analysis of Liberal Theory, Chichester, John Wiley, 1970.
12. Norman Winthrop, (Ed.), Liberal Democratic Theory and its critics, London and Canberra, Croom Helm, 1983.

C O U R S E -A 2 (Optional)

GOVERNMENT AND POLITICS IN INDIA

1. Historical Background ; Socio-Economic Bases of the Indian Political System.
2. Fundamental Rights and Directive Principles of the state policy : Implementation, achievements and short falls.
3. Nature and Working of Indian Federation, Demand for state Autonomy, Centre- State Relations. (Legislature, Administrative, and Financial.)
4. Judiciary, Judicial Review, Judiciary as an Instrument of Social Change, Independence of Judiciary, Concept of Legal Aid.
5. Ideology and Politics of the National Political Parties in India, Voting behaviour, the problem of defection.
6. Nature and Role of Pressure Groups in India.
7. Politics of Caste, Language, Regionalism, Class Structure (Rural/Urban), Role of Classes.
8. Working of the Indian Constitution as an instrument of Socio-Economic Change, Crisis of democracy, Emphasis on the issues of poverty/social justice.
9. Nationality Question in India.

SUGGESTED READINGS

CORE READINGS

1. Pylee, Constitutional Government in India.
2. J.C. Johari, Indian Politics, Jullunder, Vishal Publications, 1981.
3. Robert L. Hardgrave, Jr. and Stanley Kochanek, India : Government and Politics in a Developing Country, Delhi Freeman Book Company, 1986.
4. A. R. Desai, State and Society in India, Bombay, Popular Prakashan, 1975.
5. A.R. Desai, Recent Trends in Indian Nationalism, Bombay, D. I. Publishers, 1974.
6. A. R. Desai, Social background of Indian Nationalism, Bombay, popular prakashan, 1975.
7. Mathew Kruien, ed., Indian, state and society, Madras, Orient Longman, 1975.
8. John Morison, Indian Parliament at work.
9. D. D. Basu, Commentaries on the Constitution of India.
10. Horest Hartmann, Political Parties in India, Delhi, Meenakshi, 1977.
11. Gail Omvedt, Ed., Land, Caste, and politics in Indian state, Delhi, Author's guild publishers , 1982.
12. R. F. Dutt, India Today, Calcutta, Manisha, 1970.
13. Myron Weiner, Ed, State Politics in India, Princeton, Princeton University Press, 1968.
14. Paul R. Brass, Language, Religion and Politics.

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15. D.P. Goyal, Caste and Voting Behaviour, New Delhi : D. K. Publishers, 1984.
16. George Rosen, Democracy and Economic Change in India Berkeley.
17. S. A. Shah, Structural Obstacles to Economic Development: A Political Economy of India.
18. Y.B. Dumble, Caste, Religion and Politics in India, New Delhi, DUF and IBH Publishing House, 1982.
19. Bipon Chandra, Communalism in Modern India.
20. R. Kothari, Caste in Indian Politics, New Delhi, Longman, 1964.

ADDITIONAL READINGS

1. Norman D. Palmer, Indian Political System, London, Allen and Unwin, 1977.
2. W. H. Morris-Jones, The Government and Politics of India, Bombay, DI Publishers, 1974.
3. Henry C. Hart, Indira Gandhi's India : A Political System Reappraised, Colorado West View Press, 1976.
4. Dilip Hiro, Inside India Today, New York, Monthly Review Press, 1979.
5. David Selburne, An Eye to India, London, Penguin, 1977.
6. Stanley Kochanek, Business and Politics in India, California, California University Press, 1974.
7. Ajit Roy, Political Power in India : Nature and Trends, Calcutta, Naya Prakashan, 1983.
8. Roudolph and Roudolph, The Modernity of Tradition, Delhi Orient Longman, 1967.
9. Bipanchandra, Amlesh Tripathi, and Barunde, Freedom Struggle, Delhi, National Book Trust, 1972.

10. P. C. Majumdar, History of the Freedom Movement in India, Calcutta, Firma K.L. M., 1962.
11. Iqbal Narain, Ed., State Politics in India, Meerut, Meenakshi Prakashan, 1967.
12. Michel Brecher, Political Leadership in India : An Analysis of Elite Attitudes, New York, Praeger, 1968.
13. A. H. Hanson and Janet Douglas, Indian Democracy, Delhi Vikas, 1972.
14. Subhas Kashyap, Politics of Defection, Delhi, National Publishers, 1969.
15. Eugene F. Inschick, Politics and Social Change : Orissa, Berkely, University of California Press, 1970.
16. Andra Betelle, Caste, class and Power, Bombay, Oxford University Press, 1966.
17. K.L. Kamal, Partly Politics in an Indian State, Delhi, S. Chand, 1976.
18. Paul R. Brass, Factional Politics in an Indian State: The Congress Party in Uttar Pradesh, Bombay, Oxford University Press, 1965.
19. N. Bhaskar Rao, The Politics of Leadership in an Indian State : Andhra Pradesh, Vijayawada, Bharat Publication, 1968.
20. Kothari, Rajni, Politics in India, Delhi, Orient Longman 1970. \*
21. Kothari, Rajni, Democracy and Nation Building.
22. Curtis Michel, Comparative Politics.
23. D. K. Sen, A Comparative Study of Indian Constitution.
24. Bipan Chandra, Modern India, Delhi, N.C.E.R.T., 1971.
25. Narendra Singh, Nationality Question in India, Hyderabad, Andhra Pradesh Radical Students Union, 1982
26. D. E. Smith, Religion, Politics and Social Change in the Third World, New York : The Free Press, 1971.
27. H.S. Fauji, Muslim Political Issues and National Integration, Sterling Publishers, 1978.

C O U R S E + B I (Optional)

COMPARATIVE BUSINESS ORGANISATIONS

1. What is Business ?

Nature, Definition, and Scope of the terms business, industry, and commerce.

Business Ownership Patterns ; Modes of organising business under different Ownership patterns,

Study of Business Organisations under various ownership patterns with reference to the specific topic listed under each :

2. Private Sector

Proprietorship : Features, Advantages, Disadvantages.

Partnership : Features, Kinds, Advantages, Disadvantages.

Corporation or Joint Stock Company : Concept; Reasons for Emergence ; Distinguishing Features; Kinds of Companies ; Company Formation ; Structure of Company Management ; Introduction to corporate Finance ; Managing Agency System.

3. Public Sector

Nature and concept of Public Sector/ Public Enterprise; Reasons for Emergence; Patterns of organisation :

(i) Departmental and Ministerial organisation ;

(ii) Semi-Autonomous Enterprise;

(iii) Control Board;

(iv) Statutory Corporation;

(v) Government Company ;

(vi) Non-Profit making Public Enterprises ;

(vii) Operating Contract.

Concepts of Sector Corporation and Holding Company ;  
Criteria of classification of Public Enterprises.

4. Joint Sector

Reasons for Emergence : Nature and Concept of Joint Sector Firm.

5. Cooperative Sector

Philosophy of Cooperative Movement; Reasons for Emergence; Distinguishing Features of Cooperative Societies; Formation of Cooperative Societies; Structure of Management Cooperatives VS. Companies; Advantages of Cooperatives.

SUGGESTED READINGS

CORE READINGS

1. L.A. Keith and C. E. Gubellini, Introduction to Business Enterprise N.Y., McGraw-Hill, 1967.
2. T.H. Burnham and G.D. Heakins, Elements of Industrial Organisation, 8th Ed., Pitman, 1971.
3. Morris E. Hurley, Business Administration, 2nd Ed., New Delhi, Prentice Hall of India, 1960. (Indian Reprint of the Original U.S. Edition by Prentice Hall of U.S. A.)
4. D. S. Kimball and D. S. Kimball, Principles of industrial Organisation, Bombay, Vakils, Faffer & Simons, 1971. (Indian Reprint of 6th McGraw- Hill Edn.)
5. S. E. Thomas, Commerce : Its Theory and Practice, 9th Ed., London, Cassell, 1973.
6. J.L. Hanson, The Structure of Modern Commerce, 6th Edn., London, Macdonald & Evans, 1979.
7. R. S. Aora, Administration of Government Industries, New Delhi, IIPA, 1969.
8. Om Prakash, Theory and Working of State Corporations, 2nd Edn., New Delhi, Orient Longman, 1971.

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9. S. S. Khera, *Government in Business*, New Delhi, National, 1979.
10. N.N. Mallya, *Public Enterprises in India : their Control and Accountability*, National, 1971.
11. Laxmi Narain, *Principles and Practice of Public Enterprise Management*, New Delhi, S. Chand, 1980.
12. United Nations, *Organisation and Administration of Public Enterprises - Selected Papers* .N.Y.; U.N., 1968.
13. Avtar Singh, *Company Law*, 7th Ed., Lucknow, Eastern Book Co., 1982.
14. S. C. Kuchhal, *Industrial Economy of India*, Allahabad, Chaitanya, (Latest Ed.)
15. K.R. Kulkarni, *Theory and Practice of Cooperation in India and Abroad*, (Vol.I) 4th Ed., Bombay, Cooperator's Book Depot, 1960.
16. Samuel Paul, S.K. Dhattacharya & S. C.Kuchhal "Joint Sector : Guidelines for Policy ", *Economic and Political Weekly*, December 9, 1972.
17. H.K. Paranjape, "The Joint Sector", *E PW* November 10, 1973.
18. A. R. C. Study Team, *Report on Public Sector Undertakings* Delhi, The Manager of Publications, 1967.

#### ADDITIONAL READINGS

1. A. A. Berle & G. C. Means, *The Modern Corporation and Private Property*, N.Y., Macmillan, 1932. (19th Reprint 1962.)
2. Kailash Rai, *Principles of Company Law*, Allahabad, Allahabad Law Agency, 1981.
3. A. H. Hanson, *Parliament and Public Ownership*, connecticut, Greenwood Press, 1973. (Being the Reprint of the 1st Ed., London, Cassell, 1961.)

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4. I. Friedmann and J. F. Garner, Eds., Government Enterprise: A Comparative study, N.M., Columbia University Press, 1970.
5. L.J. Tivey, Ed., Nationalised Industries Since the 1960 London, Allen and Unwin, 1973.
6. United Nations, Organisation, Administration and Supervision of Public Enterprises in Developing Countries, N.Y., U.N., 1974.
7. C.D. Memoria, Organisation and Financing of Industries in India, Kitab Mahal, (Latest Ed.)

C O U R S E - B 2 (Optional)

FINANCIAL ADMINISTRATION

1. Concept, Nature and scope of Financial Administration. Role and status of Financial Administration in Governmental System; Framework of Financial Administration in India.
2. The Concept of Budget; Budget as a tool of management; Budget as an instrument of economic policy; performance Budgeting; Planning, Programming and Budgeting System; Integrated Approach to Planning and Budgeting; Zero Budgeting.
3. The Budgetary Process : Preparation, Legislation, and Execution of Budget.
4. Delegation of Financial Powers.
5. Financial Control : Executive and Legislative.
6. Issues in Union- State Financial Relations .

SUGGESTED READINGS

CORE READINGS

1. M.J.K. Thavaraj, Financial Administration of India, New Delhi, S. Chand & Co., 1978.

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2. G. S. Lall, Public Finance and Financial Administration in India, 2nd Ed., New Delhi, H.F.J, Kapoor, 1979.
3. K.L. Handa, Programme and Performance Budgeting, New Delhi, Uppal, 1979.
4. R. N. Dhargava, The Theory and Working of Union Finance in India, 5th Ed., Allahabad, Chaitanya Pub. House, 1977.
5. M.J.K. Thaveraj and K.L. Handa, Financial Control and Delegation, New Delhi, IIPA, 1973.
6. A. R. C. Study Team, Report on Financial Administration, Delhi, The Manager of Publications, 1968.
7. D. N. Gadhol, Parliamentary Control over Government Expenditure, Sterling, 1976.
8. R. N. Aggarwala, Financial Committees of India Parliament, Delhi, S. Chand & Co, 1966.

ADDITIONAL READINGS

1. Harold Bierman Jr. and Seymour Smidt, The capital budgeting decision : economic analysis of investment project, New York Macmillan, 1980.
2. B.B. Lal, Financial Control in a Welfare State (including public sector undertakings), New Delhi, Publications Division, 1980.
3. United Nations, Report on Budget Management Techniques in Selected Develop Countries, New York, U.N., 1978.
4. S. S. Mookerjee, India, Public Finance and Financial Administration, 1979.
5. M.Y. Khan and P.K. Jain, Financial Management, New Delhi, Tata McGraw Hill, 1982.

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C O U R S E - E 1 (Optional)

ADMINISTRATION FOR TRIBAL DEVELOPMENT

1. Tribes in Context : The Tribal Scene in India; Classification and Characteristics of Tribal Regions; The Concept of Tribal Development ; Tribal Development in India in historical Perspective : Evolution of Governmental Intervention in Tribal Development .
2. Constitutional Provisions ; Machinery for Tribal Development at the Central Level ; Tribal Development Programme and Strategy : Its Components ; Tribal Development under Five Year Plans.
3. Voluntary Action in the sphere of Tribal Development.
4. Administration for Tribal Development at the State Level with special reference to the North Eastern Region : The Agencies and their Programmes.
5. The Personnel for Tribal Development Programmes : Their Recruitment and Training ; .
6. Financing of Tribal Development Programmes.

SUGGESTED READINGS

CORE READINGS

1. B.B. Sharma, Planning for Tribal Development, New Delhi, Prachi Prakashan, 1964.
2. D. D. Sharma, Tribal Development : The Concept and the Frame, New Delhi, Prachi Prakashan.
3. B. D. Sharma, Administration for Tribal Development. (Forthcoming )
4. K.D. Gangrade, Social Legislation in India (Vols. I & II), Delhi, Concept, 1970.

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5. T. N. Chaturvedi and S. Kohli Chandra, Social Administration Development and Change, New Delhi, IIPA, 1980.
6. Planning Commission (G.C.I), The Seven Plan Documents.
7. V. M. Kulkarni, Essays in Social Administration, Delhi, Research, 1972.
8. N. V. Lalitha, Voluntary Work in India : A Study of Volunteers in Welfare Agencies, New Delhi, Nat. Inst. of Pub. Coop. & Child Development, 1975.

ADDITIONAL READINGS

1. S. K. Khinduka, Ed., Social Work in India, Jaipur, Sarvodaya Shaitya Samaj, 1962.
2. S. N. Dubey, Administration of Social Welfare Programmes in India, Bombay, Somaiya, 1973.
3. Sugata Dasgupta, Ed., Towards a Philosophy of Social work in India, New Delhi, Popular Book Service, 1967.
4. W. D. Dirrell, Social Administration : Readings in Applied Social Sciences, Middlesex, Penguin, 1973.
5. Anthony Forder, Concepts in Social Administration : A Frame-work for Analysis, London, Routledge and Kegan Paul 1974.
6. David C. Marsh, Ed., An Introduction to the Study of Social Administration, London, Routledge and Kegan Paul, 1965.
7. Radha Kamal Mukerjee, Social Welfare Policy and Administration Lucknow, Lucknow University, Inst. of Pub. Admn. 1966.

C O U R S E - 62 (Optional)

ISSUES IN RURAL DEVELOPMENT

1. Rural Development in Perspective :  
Concept of Rural Development ;  
Environmental Factor in Rural Development and  
Dimensions of Rural Poverty;  
Rural Development Policy vis- a vis the objective of  
Rural Poverty Elimination - Strategy and Performance

Contd/.../-

2. Approaches to Rural Development :  
A Complete Survey from the early Community Development Projects down to the Present-day Integrated Rural Development Programme.
3. Appropriate Technology for Rural Development.
4. Land Reforms.
5. Irrigation Development.
6. Administration for Rural Development.
7. People's Participation in Rural Development ;  
Role of Voluntary Organisations.

SUGGESTED READINGS

CORE READINGS

1. Administrative Reforms Commission Study team, Report on agricultural administration (Chairman H.H. Channabasappa), Delhi, The Manager of Publications, 1967.
2. Jara, J.S. , The Political economy of rural development; strategies for poverty alleviation, Delhi, Allied Publishers, 1983.
3. Dubhashi, P. R., Rural development administration in India, Bombay, Popular Prakashan, 1970.
4. Frankel, Francine R., India's green revolution : Economic gains and Political control , Bombay, Princeton University Press, 1971.
5. Frankel, Francine R., India's Political Economy, 1947 - 1977: The gradual revolution, Delhi, Oxford University Press, 1970.
6. Government of India, Report of the task force on Agrarian relations, Delhi, Planning Commission, 1973.

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7. Hunter, Guy, The administration of agricultural development, Lessons from India, London, Oxford University Press, 1970.
8. India, Ministry of Agriculture and Irrigation, Report of the National Commission on Agriculture, New Delhi, 1976.
9. Mathur, Kuldeep, Administrative Institutions : Political Capacity and India's strategy for Rural Development, New Delhi, IIPA, 1975.
10. Mathur, Kuldeep, Bureaucracy and the new agricultural strategy, Delhi, Concept Publishing Company, 1982.

#### ADDITIONAL READINGS

1. S. K. Sharma and S. K. Malhotra, Integrated Rural Development Approach.: strategy and Perspectives, New Delhi, Abhinav, 1977.
2. NIRD, Rural Development in India : Some Facts, Hyderabad, National Institute of Rural Development, 1979.
3. Hoshier Singh, (Ed.), Rural Development in India, Jaipur Printwell Publishers, 1985.
4. A. K. Danda, (Ed.), Studies on Rural Development, New Delhi, Inter-India Publications, 1984.
5. V. S. Mahajan, (Ed.), Studies in Indian Agriculture and Rural Development, New Delhi, Deep and Deep Publication, 1986.
6. Prabhu Ghate, Direct attacks on Rural Poverty : Policy, Programmes and Implementation, New Delhi, Concept Pub. Co., 1984.
7. S. K. Pachaur , Dynamics of Rural Development in Tribal areas, New Delhi, Concept Pub. Co., 1984.
8. Indian Journal of Public Administration, Vol.XXX, No.4, October-December, 1984. ( This Issue is devoted to Rural Development.)

- (ii) Syllabus for Post-Graduate Diploma/Certificate Programme in Public Administration -

The Board of Post-Graduate Studies in Public Administration, which met on the 28th and 29th August, 1986, framed the syllabus for Post-Graduate Diploma/Certificate Programme in Public Administration. The syllabus as framed by the Board is placed at Annexure- 'A' for consideration and approval of the Council.

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**NORTH-EASTERN HILL UNIVERSITY**

**POST-GRADUATE DIPLOMA/CERTIFICATE PROGRAMME**

**IN**

**PUBLIC ADMINISTRATION**

**SYLLABUS**

Department of Public Administration  
North Eastern Hill University  
Mizoram Campus  
Aizawl - 796007

1.

ABOUT THE DEPARTMENT

The Department of Public Administration at the North Eastern Hill University's Mizoram Campus, Aizawl, was set up with the aim of conducting Post-Graduate Instruction and Research, and Programmes for the In-Service Persons in the discipline of Public Administration. The Department's Master's Programme and Diploma/Certificate Programme are slated to commence in March, 1987.

The Department started functioning in June, 1985, and has a sanctioned faculty strength of five. This consists of one Professor, two Readers, and two Lecturers.

As a part of its post-graduate instruction and research, the Department will also start, at a later date, an M.Phil. Programme. Facilities for Ph.d. supervision are presently available.

The Department attaches high priority to the task of generating literature on problems specific to the North-Eastern Region. With that end in view, it has already taken up some projects aimed at building up literature on the North Eastern Public Administration.

2.

FOR WHOM IS THIS PROGRAMME MEANT ?

For Inservice Persons and Fresh Honours Graduates both :

The Programme, which is designed to equip participants with the knowledge of basic processes and techniques of administration and management, shall be open to both the in-service persons as well as fresh honours graduates. This, it was thought, shall yield the unique advantage to permitting an intimate interaction between two diverse groups; and that would confer upon both a unique benefit by facilitating cross-fertilisation of ideas. Besides, it would lend a vigorous support to the learning environment to have two distinctly different set of students closely rubbing shoulders with each other.

Government and Para-Governmental Personnel :

The in-service persons shall be drawn mainly from within the government departments and the para-governmental agencies like, for instance, the industrial and commercial public enterprises, including banks and insurance companies, etc.; local government institutions; cooperative societies; and so forth.

Other Categories of Participants:

Since the main purpose of the Programme shall be to provide an understanding of the organisational and administrative processes obtaining in government and public administration, it would, no doubt, be of a particular interest to members of their personnel. To the extent, therefore, that public institutions, voluntary agencies, and private business firms are invited to interact with the government on a regular or ongoing basis and may, therefore, be interested in understanding the basis of its functioning, the Programme may be of interest and value to educational administrators, members of the industry and business executive as well. Its design and content should be able to meet the requirements of a wide range of participants and to draw its essential strengths from the various backgrounds of its participants.

AIMS AND OBJECTS OF THE PROGRAMME

The Programme is designed to provide an extended exposure to the varied dimensions of Public Administration as an academic discipline. The programme also includes inputs designed to assist a well-rounded view of public administration as a vehicle of economic and social transformation. Finally, the Programme should contribute to a widening of the intellectual and professional horizons of the participants.

The participants should be able to receive an extended and sustained exposure to a rich environment which will, through a supply of the vital theoretical and conceptual inputs, in return reinforce their work experience. The teachers, contemplating administrative careers, should be able to develop familiarity with the basic dimensions and dynamics of public administration in a permissive ethos characterised by discussion of cases and field problems and an intense interaction with their inservice counterparts. This interactive ethos shall be to the mutual advantage of both the groups of participants.

4. ELIGIBILITY REQUIREMENTS

Eligibility conditions for two sets of participants shall be as follows.

Unservice Persons :

- (i) A minimum of two years of work experience (those holding supervisory positions shall receive preference).
- (ii) A Bachelor's Degree (Honours or Pass Course) in any subject.

Freshers :

An Honours Bachelor's Degree in any subject.

5. NUMBER OF SEATS

Total number of seats available shall be 35.

6. DURATION OF THE PROGRAMME AND THE LINK-UP BETWEEN DIPLOMA/  
CERTIFICATE PROGRAMMES

The Diploma Programme, comprising eight courses, shall be of the length of one Academic Year (two semesters). Each semester shall comprise instruction in four courses. The candidates who pursue only one semester (first of the two semesters) shall upon its successful completion, become eligible for the award of 'Certificate'. Thus the completion of one semester of instruction qualifies candidates for Certificate-level qualification, whereas those completing the full one Academic Year (Two-Semester) package shall become eligible for the award of 'Diploma'.

Therefore, the two-semester Diploma Programme accommodates within its framework the one-semester Certificate Programme: so that, such students as have successfully completed the one-semester Certificate Programme could, if they so desired, graduate into diploma-level qualification by completing the second semester of instruction.

A student could, if she/he so desired, return to the University to pursue her/his second semester of studies after a gap of time; studies for Certificate and Diploma Programmes do not necessarily have to be pursued in consecutive semesters.

The Certificate and Diploma Programmes shall respectively be designated as Post-Graduate Certificate in Public Administration and Post-Graduate Diploma in Public Administration.

7.

STRUCTURE

The structure of the Diploma Programme shall be as under :

First Semester

- Course 1 : Elements of Public Administration
- Course 2 : Public Personnel Administration
- Course 3 : Indian Administrative System
- Course 4 : One of the following :
  - (a) Comparative Business Organisations
  - (b) Office Management

Second Semester

- Course 5 : Development Administration
- Course 6 : Economic Administration
- Course 7 : Social Administration
- Course 8 : Administrative Institutions of the Hill Areas of the North-Eastern India

The Certificate candidates shall undergo instruction in the first four courses (First Semester); the Diploma candidates shall additionally undergo instruction in the four courses (Course 5 to course 8) included in Second Semester.

8.

SEMESTER

In each semester four courses will be completed and evaluated.

9.

EVALUATION

Evaluation of candidates in respect of each course will be done through the assessment of continuous sessional work and through an examination at the end of the semester. 25% of the marks are allotted for internal assessment and 75% for semester examination (subject to such change as may be made by the University).

Internal Assessment shall be based on sessional work; sessional work will consist of term papers, tests, and class/seminar participation. Details of the Procedure of evaluation for sessional work shall be made available to students at the commencement of the semester.

The semester examination will be held as per the specifications laid down in the ordinances.

10. ATTENDANCE

A minimum of 75% of attendance is necessary for appearance in semester examinations.

11. TEACHING HOURS

Keeping in view the fact that there shall be inservice persons on this Programme, it has been decided to conduct classes during the morning hours. This is to enable the inservice participants to combine work with study and to obviate the need for them to remain on leave from office while the Course lasts.

12. LINK-UP BETWEEN DIPLOMA AND MASTER'S PROGRAMMES

Such diploma-holders as fulfill the eligibility criteria for admission into the Master's Programme (namely, an honours bachelor degree in any subject) shall be able to earn their Master's Degree in Public Administration after pursuing and successfully completing a further one year programme of study involving instruction in eight courses. They shall additionally have to complete the requirement of practical training stipulated under the Master's Programme.

This would, of course, necessitate - to avoid repetition of courses for diploma-holders desiring to graduate into Master's qualification under this provision - shuffling of courses (from one part to the other) in respect of the Department's Master's Programme.

SYLLABUS

- 1 -

COURSE - I

ELEMENTS OF PUBLIC ADMINISTRATION

1. What is Public Administration?
  - (A) Nature and scope of Public Administration;
  - (B) The Role of three Branches;
  - (C) Politics and Administration;
  - (D) Policy and Administration;
  - (E) Private and Public Administration;
  - (F) Management and Administration;
  - (G) Public Administration and Development Administration;
  - (H) Public Administration and Comparative Public Administration;
  - (I) Public Administration and Public Enterprise;
  - (J) Public Administration and Bureaucracy.
2. Elements of Organisation Theory: Classical, Human Relations, and Systems Schools.
3. Administrative organisation (a) Concept (b) Structure, (c) Forms. (d) Centralisation, Decentralisation, Delegation (e) Headquarters & Field Agencies.
4. Management Processes (with reference to);
  - (A) Decision Making.
  - (B) Leadership.
  - (C) Motivation.
5. Budgeting Process

SUGGESTED READINGS

CORE READINGS

1. Felix A. Nigro, Modern Public Administration, (2nd Edn): Harper International Edition, Harper & Row, 1970.
2. Micheal P. Barber, Public Administration, London, Macdonald & Evans, 1972.
2. John M. Pfiffner and Frank P. Sherwood, Administrative Organisation, Englewood Cliffs, N.J., Prentice Hall, 1960.

4. R.I. Drake and P.j.Smith, Behavioural Science in Industry, London, McGraw-Hill, 1973.
5. Daniel A. Wren, The Evolution of Management Thought, N.Y., The Ronal Press Co, 1972.
6. Claude S. Goerge, The History of Management Thought, Englewood Cliffs, N.J., Prentice Hall, 1968.
7. Nicos P.Mouzells, Organisation and Bureaucracy, London, Routledge and Kegan Paul, 1967.
8. Joseph L. Massie, Essentials of Management, Englewood Cliffs, N.J., Prentice Hall, 1971.
9. H.A.Simon, D.W. Smithburg, V.A.Thompson, Public Administration, New York, Alfred Knoff, 1967.
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2. Dwight Walde, The Administrative State, New York, Ronald, 1948.
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4. Herbert A. Simon, Administrative Behaviour, (2nd Edn.), New York, Free Press, 1957.
5. A. Etzioni, A comparative Analysis of Complex Organisations, Glencoe, Ill., Free Press, 1961.
6. A. Etzioni, (Ed.), Complex Organisations : A Sociological Reader, N.Y., Holt, Rinehart & Winston, 1961.
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8. Keith Davis, Human Behaviour at Work, McGraw-Hill, 1972.
9. Cyril Sofer, Organisation in Theory and Practice, London, Heinemann Educational Books, 1972.
10. Dwight Waldo, Ed., Ideas and Issues in Public Administration. N.Y., McGraw-Hill, 1963.
11. S.R. Maheshwari, (Ed.), The Teaching of Public Administration in India, New Delhi, IIPA.
12. S. Gellerman, Behavioural Science in Management, Penguin.
13. Woodrow Wilson, "The Study of Public Administration," (in) Albert Lepawsky, Administration, Calcutta, Oxford & IBH, (Second Indian Reprint) 1970.
14. L. Gulick and L. Urwick, Papers on the Science of Administration, N.Y., Inst of Pub. Admn., 1937.
15. R.B. Jain, "Public Administration : A Developing Discipline," IJPA. (Vol. & Issue to be identified.)

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3. Feuler, James W., Public Administration : Theory and Practice (Englewood Cliffs, N.J., Prentice-Hall, 1980.)
4. Henry, Nicholas, Public Administration and Public Affairs, Second Edition (Englewood Cliffs, N.J., Prentice-Hall, 1980.)
5. Hill, Larry B., and Hebert, F. Ted, Essentials of Public Administration (North Scituate, Mass.: Duxbury Press, 1979).
6. Lorch, Robert S., Public Administration (New York: West, 1978).
7. McKinney, Jerome B., and Howard, Lawrence C., Public Administration: Balancing Power and Accountability (Oak Park, Ill.: Moore, 1979).
8. Nigro, Felix A., and Nigro, Lloyd G., Modern Public Administration, Fifth Edition (New York: Harper & Row, 1980).
9. Shafritz, Jay M., and Hyde, Albert C., Classics of Public Administration (Oak Park, Ill.: Moore, 1978).
10. Williams, J.D., Public Administration. The People's Business (Boston: Little, Brown and Company, 1980).

C O U R S E - 2

PUBLIC PERSONNEL ADMINISTRATION

1. Nature and concept of Public Personnel Administration.
2. Theories of Bureaucracy with particular reference to the contributions of Mac Weber, Robert Merton, Philip Selznich, and Elvin Gouldner.
3. Study of Indian Public Personnel System with reference to :
  - (a) Organs responsible for Personnel management.
  - (b) Union Public Service Commission.
  - (c) Structure of civil service.
  - (d) Recruitment, classification, training, and promotion practices in respect of higher civil services.
  - (e) Salary Administration.
  - (f) Political Rights and Rights to organise and strike of civil servants.
  - (g) Conditions of service.
  - (h) Conduct Rules, Disciplinary Action, Removal, and Appeals.
  - (i) Machinery for Redressal of civil service grievances.

SUGGESTED READINGS

CORE READINGS

1. D. Glenn Stahl, Public Personnel Administration, (7th Edn.), N.Y., Harper, 1976. (Indian Edition by Oxford & IBH).
2. Felix A. Nigro, Public Personnel Administration.
3. S.L.Goel, Public Personnel Administration, New Delhi, Sterling, 1984.

4. S.P.Verma and S.K. Sharma, Managing Public Personnel Systems, (2nd Edn.), New Delhi, IIPA, 1985.
5. Asok Chanda, Indian Administration, (2nd Ed.), London, Allen & Unwin, 1967.
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7. C.P.Bhambhri, Public Administration in India, Vikas, (Latest Edn.).
8. Administrative Reforms Commission (ARC) Study Team, Report on Personnel Administration, Delhi, The Manager of Publications, 1967.
9. ARC, Report on Personnel Administration, Delhi, The Manager of Publications, 1969.
10. V.A. Pai Panandikar, Personnel Administration-Implementing the Reforms, New Delhi, IIPA, 1970.
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15. R.B.Jain, (Ed.), Aspects of Personnel Administration, New Delhi, IIPA.
16. K. Diesh, Et. al., Management in Government, New Delhi, Publications Division. (G.O.I)

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1. Dale Yoder, Personnel Management and Industrial Relations, New Delhi, Prentice Hall of India. (Latest Ed.).
2. R.S.Davar, Personnel Management and Industrial Relations, (2nd Edn.), Bombay, Vikas, 1981.

3. P.C.Tripathi, Personnel Management, New Delhi, S. Chand & Sons, 1980.
4. P. Pigors & C.A. Myers, Personnel Administration - A point of view and method, McGraw-Hill. (latest Edn).
5. J.D.Miner, Personnel and Industrial Relations - A Managerial Approach, New York, Macmillan. (Latest Edn.).
6. Ferrel Heady, Public Administration : A Comparative Perspective
7. C.N. Bhalerao, Public Service Commissions of India - A Study, New Delhi, Sterling, 1967.
8. Niru Hazarika, Public Service Commissions, New Delhi, Concept, 1976.

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1. Fulmer, Robert M., The New Management, Second Edition (New York: Macmillan, 1978).
2. Gortner, Harold F., Administration in the Public Sector, Second Edition (New York: John Wiley & Sons, 1981).
3. Kramer, Fred A., Dynamics of Public Bureaucracy (Cambridge, Mass.: Winthrop, 1977).
4. Meier, Kenneth J., Politics and the Bureaucracy (North Scituate, Mass.: Duxbury Press, 1979).
5. Nachmias, David, and Rosenbloom, David H., Bureaucratic Government. USA (New York: St. Martin's Press, 1980).
6. Schuman, David, Bureaucraties, Organisations, and Administration (New York: Macmillan, 1976).
7. Seitz, Thomas Steven, Bureaucracy, Policy, and the Public (St Louis: C.V. Mosby, 1978).
8. Sutherland, John, Editor, Management Handbook for Public Administrators (New York: Van Nostrand Reinhold, 1978).

Contd..9/-

E Q U E S T I O N S = 3

INDIAN ADMINISTRATIVE SYSTEM

1. Indian Administration during British Rule and in its contemporary context (A synoptic view)
2. Framework :  
Salient Features of the Constitution; Parliamentary Democracy; Federal System; Political Executive : President, Prime Minister, Council of Ministers, Cabinet; Cabinet Secretariat.
3. Secretariat; Ministries and Departments; Attached Offices & Subordinate offices; Procedures of work.
4. Role of constitutional Agencies and Extra-Departmental Bodies - Introductory Reference.
5. Administration at the state level : Political Executive; State Secretariats; Boards of Revenue.
6. Administration at the District Level : District as a unit of administration; Role of District Collector; District Administration Hierarchy.
7. Local Administration (An Introduction) : Concept of community Development; C.D. & N.E.S. Blocks; concept of Panchayati Raj; Three-Tier Structure under P.R.; Urban Local Government.

SUGGESTED READINGS

CORE READINGS

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2. S.R.Maheshwari, Evolution of Indian Administration, Agra, Lakshmi Narain Agarwal.

3. S.R.Maheshwari, Local Government in India, Agra, Laxmi Narain Agarwal.
4. S.R.Maheshwari, State Governments in India, New Delhi, Macmillan, 1979.
5. S.R.Maheshwari, Public Administration in India : Management of Change, Bangalore, Bangalore University.
6. S.R.Maheshwari, Administrative Reforms in India, New Delhi, Macmillan, 1980.
7. S.R.Maheshwari, Rural Development in India, New Delhi, Sage Publications.
8. S.S.SKhara, District Administration in India, Bombay, Asin, 1964.
9. C.P.Bhambhri, Public Administration in India, Bombay, Vikas.
10. A. Avasthi, Central Administration, McGraw-Hill, 1980
11. Asok Chanda, Indian Administration, (2nd Ed.), London, Allen & Unwin, 1967.
12. R.B. Jain, (Ed.), District Administration, New Delhi, IIPA.
13. R.B.Jain, (Ed.), Panchayati Raj, New Delhi, IIPA.
14. A. Datta, Local Government, New Delhi, IIPA.
15. S.L. Kaushik and P.Sahni, (Eds.), Public Administration in India: Emerging Trends, Allahabad, Kitap Mahal, 1983.
16. Administrative Reforms Commission Study Team, Reports on : (1) Machinery of the Government of India and its Procedures of work; (ii) State Level Administration; (iii) District Administration; and (iv) Centre-State Relations, Delhi, The Manager of Publications.

17. Special Issues of The Indian Journal of Public Administration, (New Delhi, IIPA) on: (i) The Collector in the 1960s (1965); (ii) State Administration in India (1976), (iii) Union-State Relations - Administrative Aspects (1970).
18. Secretariat Training School (Ministry of Home Affairs, G.O.I., New Delhi), Organisational Set up and Functions of the Ministries/Departments of the Government of India. Delhi, The Manager of Publications (Latest Edition),
19. R.B. Jain, Contemporary Issues in Indian Administration, New Delhi, Vishal, 1976.
20. O.P.Dwivedi & R.B.Jain, India's Administrative State, New Delhi, Geetanjali Pub. House, 1985.
21. Hardwar Rai, Current Ideas and Issues in Indian Administration, New Delhi, Uppal Pub. House, 1981.
22. R.K. Arora, Ed., Administrative Change in India, Jaipur, Aalakh, 1974.

#### ADDITIONAL READINGS

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2. Rajni Kothari, Politics in India, New Delhi, Orient Longman, 1970.
3. S.P.Verma and S.K.Sharma, (Eds.), Development Administration, New Delhi, IIPA.
4. K.K.Puri, (Ed), Public Administration : Indian Spectrum, Allahabad, Kitab Mahal, 1985.
5. Balwant Rai Mehta Committee Report on Panchayati Raj, Delhi, The Manager of Publications, 1957.
6. Ashok Mehta Committee Report on Panchayati Raj, Delhi, The Manager of Publications, 1978.

7. B.N.Puri, Some Aspects of the Evolution of Indian Administration, New Delhi, IIPA.
8. S.R. Maheshwari, (Ed), Administrative Reforms, New Delhi, IIPA.

#### JOURNALS

1. Indian Journal of Public Administration (Journal of the IIPA, New Delhi).
2. Journal of Constitutional and Parliamentary Studies (Journal of the Inst. of Constitutional and Parliamentary Studies, New Delhi).
3. Management in Government (Journal of the Department of Personnel and Administrative Reforms, Ministry of Home Affairs, New Delhi).
4. Indian Journal of Political Science (Journal of the Indian Political Science Association).
5. Political Science Review (Journal of the Department of Political Science, University of Rajasthan, Jaipur).

Contd..13/-

C O U R S E = 4COMPARATIVE BUSINESS ORGANISATIONS

## 1. What is Business ?

Nature, Definition, and Scope of the terms business, industry, and commerce.

Business Ownership Patterns; Modes of organising business under different ownership patterns.

Study of Business Organisations under various ownership patterns with reference to the specific topics listed under each :

2. Private Sector :

Proprietorship : Features, Advantage, Disadvantages.

Partnership : Features, kinds, Advantages, Disadvantages.

Corporation or Joint Stock Company : Concept; Reasons for Emergence; Distinguishing Features; Kinds of companies; Company Formation; Structure of Company Management.

Managing Agency System.

3. Public Sector

Nature and concept of Public Sector/Public Enterprise; Reasons for Emergence; Patterns of organisation :

(i) Departmental and Ministerial organisation :

(ii) Semi-Autonomous Enterprise;

(iii) Control Board ;

(iv) Statutory Corporation ;

(v) Government Company ;

(vi) Non-Profit making Public Enterprise ;

(vii) Operating Contract.

Concepts of Sector Corporations and Holding Companies ;

Criteria of classification of Public Enterprises.

4. Joint Sector

Reasons for Emergence; Nature and Concept of Joint Sector Firm.

5. Cooperative Sector  
Philosophy of Cooperative Movement; Reasons for Emergence;  
Distinguishing Features of Cooperative Societies; Formation  
of Cooperative Societies; Structure of Management; Cooperatives  
VS. Companies; Advantages of Cooperatives.

SUGGESTED READINGS

CORE READINGS

1. L.A.Keith and C.E.Gubellind, Introduction to Business Enterprise, N.Y., McGraw-Hill, 1967.
2. T.H.Burnham and G.O.Hoskins, Elements of Industrial Organisation, 8th Ed, Pitman, 1971.
3. Morris E.Hurley, Business Administration, 2nd Ed., New Delhi, Prentice Hall of India, 1968. (Indian Reprint of the Original U.S. Edition by Prentice Hall of U.S.A.)
4. D.S.Kimball and D.S. Kimball, Principles of Industrial Organisation, Bombay, Vakils, Feffer & Sissons, 1971. (Indian Reprint of 6th McGraw-Hill Edn.).
5. S.E. Thomas, Commerce : Its Theory and Practice, 9th Edn., London, Cassell, 1973.
6. J.L. Hanson, The Structure of Modern Commerce, 6th Edn., London, Macdonald & Evans, 1979.
7. R.S.Arora, Administration of Government Industries, New Delhi IIPA, 1969.
8. Om Prakash, Theory and Working of State Corporations, 2nd Edn., New Delhi, Orient longman, 1971.
9. S.S.Khera, Government in Business, New Delhi, National, 1979.
10. N.N. Mallya, Public Enterprises in India : Their Control and Accountability, National, 1971.

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12. United Nations, Organisation and Administration of Public Enterprises - Selected Papers, N.Y., U.N., 1968.
13. Avtar Singh, Company Law, 7th Ed., Lucknow, Eastern Book Co., 1982.
14. S.C. Kuchhal, Industrial Economy of India, Allahabad, Chaitanya. (Latest Ed.).
15. K.R. Kulkarni, Theory and Practice of Cooperation in India and Abroad. (Vol.I) 4th Ed., Bombay, Cooperators Book Depot, 1968.
16. Samuel Paul, S.K. Bhattacharya & S.C.Kuchhal, "Joint Sector: Guideline for Policy", Economic and Political Weekly, December, 9, 1972.
17. H.K.Faranjape, "The Joint Sector", EPW, November 10, 1973.
18. A.R.C. Study Team, Report on Public Sector Undertakings, Delhi, The Manager of Publications, 1967.

#### ADDITIONAL READINGS

1. A.A.Berle & G.C.Means, The Modern Corporation and Private Property, N.Y., Macmillan, 1932. (19th Reprint, 1962.)
2. Kailash Rai, Principles of Company Law, Allahabad, Allahabad Law Agency, 1981.
3. A.H.Hanson, Parliament and Public Ownership, connecticut, Greenwood Press, 1973. (Being the Reprint of the 1st Ed., London, Cassell, 1961.)
4. W.Friedmann and J.F. Garner, Eds., Government Enterprise : A comparative Study, N.Y., Columbia University Press, 1970.
5. L.J.Tivey, Ed., Nationalised Industries Since the 1960, London, Allen & Unwin, 1973.
6. United Nations, Organisation, Administration and Supervision of Public Enterprises in Developing Countries, N.Y., U.N., 1974.
7. C.B.Mamoria, Organisation and Financing of Industries in India, Kitab Mahal. (Latest Ed.)

11. Laxmi Narain, Principles and Practice of Public Enterprise Management, New Delhi, S. Chand, 1980.
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3. A.H.Hanson, Parliament and Public Ownership, Connecticut, Greenwood Press, 1973. (Being the Reprint of the 1st Ed., London, Cassell, 1961.)
4. W.Friedmann and J.F. Garner, Eds., Government Enterprise : A comparative Study, N.Y., Columbia University Press, 1970.
5. L.J.Tivey, Ed., Nationalised Industrial Since the 1960, London, Allen & Unwin, 1973.
6. United Nations, Organisation, Administration and Supervision of Public Enterprises in Developing Countries, N.Y., U.N., 1974.
7. C.B.Mamoria, Organisation and Financing of Industries in India, Kitab Mahal. (Latest Ed.)

C O U R S E - 4OFFICE MANAGEMENT

1. Definition, Functions, and role of office management in the Administrative Process.
2. Basic Principles of Office Organisation  
 Location and lay-out of office, objectives of lay-out, Furnishing and Equipping.  
 Coordination between sections.  
 Organisation of Reception, conference/meeting, seminar/symposium.  
 Use of Mechanical devices, their classification and Utilization.
3. Office Procedures  
 Receipt of Dak, Distribution of Dak; Submission and Diarisation of Receipts; Action on Receipts.  
  
 Filing System Types  
 Indexing  
 Record Management  
  
 Forms and Procedures of Communication; Drafting of Communications, Issue of Drafts.  
  
 Special Procedures for confidential papers/ Documents; their receipt, despatch and custody.  
  
 Public Relation : its significance and role in office management.
4. Office Improvement Techniques - A brief Survey  
 O & M Work Study, Job Analysis, Performance Budgeting, Consultative Machinery, Management by objectives, Participative Management Inspections.

SUGGESTED READINGSCORE READINGS

1. Neuren and Haynes, Office Management - Principles and Practices.

2. Mills and Standingford, Office Organisation and method.
3. Mills and Standingford, (Ed), Office Administration.
4. N.K. Panda, Work Study in Administration.
5. H.M. Tredeury, The Practice of Organisation and Method, London, 1955.
6. G.E.Milward, Organisation and Methods, London, Macdonald and Evans, 1950.
7. Secretariat Training School (Ministry of Home Affairs), Office Procedures, Delhi, The Manager of Publications.

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1. Secretariat Training School (Ministry of Home Affairs), Work Study (Parts I to IV)
2. Public Administration Service (Chicago), Work Simplification, 1951.
3. C.T.I. Bernard, Organisation and Management, Harvard, Cambridge, Mass, 1958.
4. H.O.Dovey, Hand Book of organisation and Methods Techniques, I.I.A.S., Brussels, 1951.
5. G.Nadler, Work Simplification, St. Louis Washington University, 1957.

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C O U R S E - 5DEVELOPMENT ADMINISTRATION

1. Concept, Importance and Scope of Development Administration.  
Public Administration and Development Administration.  
Development - Non-Developmental Dichotomy.
2. Concept of Administrative Development.
3. Concepts of Development and Modernisation.  
Concepts of Economic Development, Political Development, and Social Change.
4. Features of Public Administration in Developing Countries.  
Orienting Public Administration to handle development : Two Challenges :  
(i) Evolving new organisational forms, and (ii) Reorienting bureaucracy.  
In the remaining course these two aspects shall be studied.
5. Organisation for Development (Search for new forms)  
Planning Machinery : Why Commission - or Board-Type of Organisation?  
(A Survey of Planning Machinery in India at Central and State Levels.)  
Forms of Organisation for Public Enterprise Management :  
Why search is made for 'new' forms of organisation ?  
What these forms are ? ( A survey of organisational patterns of Public Enterprise with reference to India.)  
Command Area Development and Integrated Rural Development :  
Their purpose and organisational setup.  
Democratic Decentralisation (A Strategy of Development through Participation) : The Pattern of Panchayati Raj Institutions; NES and Community Development Blocks.
6. Bureaucracy and Development  
Characteristic Features of Bureaucracy in developing countries,

Role of Bureaucracy in Development.  
 How to Prepare Bureaucracy for developmental tasks ?  
 What it involves ?  
 Neutral Civil Service VS Committee Bureaucracy.

CORE READINGSSUGGESTED READINGS

1. A. A. Avasthi and R.K. Arora, (Ed ), Bureaucracy and Development in India, New Delhi, Associated Pub. House.
2. S.P.Venma and S.K.Sharma, (Eds), Development Administration, New Delhi, IIFA.
3. R.K.Arora, (Ed), Perspectives in Administrative Theory, New Delhi, Associated Pub. House, 1979.
4. R.K.Arora, Comparative Public Administration, New Delhi, Associated Pub. House, 1972, (Reprinted 1985).
5. C.N.Bhalerao, (Ed). Administration, Politics and Development In India, Bombay, Lalwani, 1972,
6. R. Brahmanti and J.J.Spengler, Administration and Economic Development in India, Duke University Press.
7. U.N.O., Development Administration : Current Approaches and Trends in Public Administration for National Development New York, U.N.O., 1975.
8. V.A. Rai Panandiker, (Ed). Development Administration in India, 1974.
9. S.K.Sharma, Ed. Dynamics of Development (Two Vols. )New Delhi, concept Pub. House.
10. Fred W. Riggs, (Ed). Frontiers of Development Administration, Durham, N.C. Duke University Press, 1970.
11. Irwing Swordlow, (Ed). Development Administration : Concepts and Problems, Syracuse, N.Y., Syracuse University Press, 1963.
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13. Edward Weidner, (Ed), Development Administration in India, Durham, N.C. Duke University Press, 1970.

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14. Edward Weidner, *Technical Assistance in Public Administration: The Case for Development Administration*, Chicago, Public Administration Service, 1964.
15. Tarlok Singh, *India's Development Experience*, New Delhi, 1974.
16. *Journal of Social and Economic Studies*, Vol. 2, No. 4, Oct-Dec. 1985 (This is a special issue on Development Administration).
17. O.F. Dwivedi and R.B.Jain, *India's Administrative State*.
18. R.B.Jain, *Bureaucratic Values in Development*, New Delhi, Uppal, 1982.

#### ADDITIONAL READINGS:

1. Keith Henderson, *Emerging Synthesis in American Public Administration*, Bombay, Asia, 1966.
2. Joseph La Palombara, (Ed), *Bureaucracy and Political Development*, Princeton, N.J., Princeton University Press, 1963.
3. A.H.Hanson, *The Process of Planning*, London, Oxford University Press, 1966.

#### ARTICLES:

1. V.A.Pai Panandiker, *Development Administration: An Approach*. IJFA, Vol. X, 1964, pp. 34-43.
2. W. Wood, *Development Administration : An Objection*, IJFA, Vol. XIII, 1967, pp. 702-13.
3. O.P.Dwivedi and J. Nef, *Development Theory: A fence around an empty lot*, IJFA (Vol. & No. to be identified).
4. O.P.Dwivedi and J.Nef, *Crises and Continuities in the Theory of Development, Public Administration and Development*. (Vol. & No. to be identified).

#### JOURNALS:

1. *Journal of Social and Economic Studies*. (Sage Publications India Pvt. Ltd., P.O.Box 4215, New Delhi - 48).
2. *Indian Journal of Public Administration*. (Journal of the IJFA, New Delhi - 2).

Contd/...

## COURSE - 6

## ECONOMIC ADMINISTRATION

## 1. Introduction -

A. What is Economic Administration?

Evolution, Nature, Scope and Techniques of Economic Administration

B. Role of Government in Economic Development.

## 2. Indirect Intervention -

A. Framework of Indirect Intervention.

B. Regulation and Promotion of Industry and Agriculture in India.

## 3. Direct Intervention -

A. Nature and concept of Public Enterprise.

B. Status and Role of Public Enterprise in Indian economy.

C. Organisational patterns of Public Enterprise with reference to India : Department and its variants, Public Corporation, Government Company.

## 4. Economic Planning -

A. Evolution and Concept.

B. Planning machinery at the Central and State, levels in India.

C. Planning process at the central level in India: Plan formulation, implementation and financing.

D. Problems of plan implementation in India.

## SUGGESTED READINGS

## CORE READINGS:

1. D. Bright Sing, Economic Development, Vikas (latest edn.)
2. Clair Wilcox, Public Policies Toward Business.
3. B.C.Tandon, Economic Planning : Theory and Practice, Allahabad, Chaitanya Pub. House (latest edn.)
4. S.S.Khera, Government in Business, New Delhi, National Pub. House, 1979.

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5. A. Dasgupta and N.K.Sengupta, Government and Business in India, Allied Book Agency, 1978.
6. A.H.Hanson, Public Enterprise and Economic Development, London, Kegan Paul, 1962.
7. S.C.Kuchal, The Industrial Economy of India, Allahabad, Chaitanya Pub. House, (Latest Edn).
8. C.B.Mamoria, Organisation and Financing of Industries in India, Kitab Mahal, (latest edn.)
9. Laxmi Narain, Principles and Practice of Public Enterprise Management, New Delhi, S.Chand & Sons, 1980.
10. W.A.Robson, Nationalised Industry and Public Ownership, (2nd Edn.). London, Allen & Unwin, 1962.
11. V.V.Ramanadhan, (Ed). The Nature of Public Enterprise, London, Croom Hel, 1984.
12. Om Prakash, Theory and Working of State Corporations, (2nd Edn.), New Delhi, Orient Longman, 1971.
13. Centre for Monitoring Indian Economy, Public Sector, Bombay, Centre for Monitoring Indian Economy. (latest edn.)
14. L.A.Keith and C.E.Cubellini, Introduction to Business Enterprise. New York, McGraw Hill, 1962.
15. A.H.Hanson, The Process of Planning, Oxford University Press, 1966.
16. Ishwar Dayal, et.al., Dynamics of Formulating Policy in Government of India - Machinery for policy development, Delhi, Concept Pub. Co. 1976.
17. A.R.C. Study Team, Report on Public Sector Undertakings, Delhi, The Manager of Publications.
18. A.R.C., Report on Public Sector of Undertakings, Delhi, The Manager of Publications.
19. A.R.C. Study Team, Report on Machinery for Planning, Delhi The Manager of Publications.
20. A R C, Report on Machinery for Planning, Delhi, The Manager of Publications.
21. Kkota Prasad, Planning and its Implementation, New Delhi, IIPA.

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## ADDITIONAL READINGS:

1. Edward S. Mason, Economic Planning in Under Developed Areas, New York, Fordham University Press, 1961.
2. G.M. Neier and R.E. Baldwin, Economic Development, N.Y. Wiley, 1957.
3. W.G. Friedmann, State and the Rule of Law in a Mixed Economy, Stevens, 1971.
4. A.H. Hansen, Parliament and Public Ownership, Connecticut, Greenwood Press, 1973 (Originally published by London, Cassell, 1961).
5. R.S. Arora, Administration of Government Industries, New Delhi, Indian Institute of Public Administration (IIPA).
6. Leonard Trivey, Nationalisation in British Industry, (2nd edn.) London, Jonathan Cape, 1972.
7. Leonard Trivey, (Ed), The Nationalised Industries Since 1960, London, Allen and Unwin, 1973.
8. W. Friedmann, & J.P. Garner (Eds), Government Enterprise A Comparative Study, New York, Columbia University Press, 1970
9. S.E. Thomas, Commerce : Its theory and practice, London, Cassell.
10. J.L. Hanson, The Structure of Modern Commerce, 6th Ed., London, Macdonald & Evans, 1979.

11.

## COURSE - I

## SOCIAL ADMINISTRATION

1. Concept, Nature and Scope of Social Administration.
2. Organisation for Social Administration at Central, State and local levels:
  - A. Central Department of Social Welfare, Case for creation of an integrated Ministry for Social Affairs; Central Social Welfare Board - Its Composition, Functions and Status.
  - B. The State level Department/Directorates of Social Welfare; Controversy regarding their roles; the State level Social Welfare Boards.
  - C. Social Administration at District, Block and Village levels.

Contd/...

3. Methods of Social Administration (Social work processes):  
Social Case Work, Social Group Work, Community Organisation.
4. Role of Voluntary Agencies and their relationship with Government.
5. Post-Independent Social Legislation in India.
6. Social Planning in India - Social Development Sector under the Five-Year Plans.

#### SUGGESTED READINGS

##### CORE READINGS:

1. David C. March, Ed., *An Introduction to Social Administration*, London, Routledge and Kegan Paul.
2. G.B. Sharma, *Social Administration in India*, Jaipur, Unique Traders, 1970.
3. Walter A. Friedlander, *Introduction to Social Welfare*, New Delhi, Prentice Hall of India, 1967.
4. V. Jagannadham, *Social Welfare Organisation*, New Delhi, IIPA.
5. T.N. Chaturvedi & S. Kohli - Chandra (Eds), *Social Administration : Development and Change*, New Delhi, IIPA.
6. D. Paul Choudhury, *Social Welfare Administration*, Delhi, Atma Ram & Sons, 1979.
7. B. Paul Choudhury, *Social Welfare Administration through Voluntary Agencies*, Delhi, Atma Ram, 1960.
8. Planning Commission, *Social Welfare in India*, New Delhi, Planning Commission, 1955.
9. R.N. Saksena, *Sociology and Social Policy in India*, Calcutta, Orient Longman.
10. Planning Commission, *Social Legislation: Its Role in Social Welfare Planning*, New Delhi, 1959.
11. R.M. Titmus, *Essays on Welfare State*.
12. S.K. Khinduka, *Social Work in India*.
13. Planning Commission, *VII Plan Document*, New Delhi, 1986.

Contd/...

## ADDITIONAL READINGS:

1. T.N.Chaturvedi, Ed., Administration for Child Welfare, New Delhi, IIPA. (Indian Institute of Public Administration).
2. T.N.Chaturvedi, Ed., Administration for the Disabled, New Delhi, IIPA.
3. V. Jagannadham & M.Bhattacharya, Integrated Delivery System for Social Services, New Delhi, IIPA.
4. A.R.Wadia, (Ed)., History and Philosophy of Social Work in India.
5. India, Encyclopaedia of Social Work, New Delhi, Publications Division 1968.
6. H.H.Stroup, Social Work: An Introduction to the Field, N.Y. American Book; 1960.
7. W.A.Friedlander, (Ed)., Concepts and Methods of Social Work, Englewood Cliffs, N.J., Prentice Hall; 1958.
8. Arthur Hillman, Community Organisation and Planning, N.Y., Macmillan; 1950.

## COURSE - 8

ADMINISTRATIVE INSTITUTIONS OF THE HILL AREAS  
OF THE NORTH EASTERN INDIA

1. Constitutional Framework: The Sixth Schedule.
2. District Administration in the North Eastern India with special reference to Assam, Meghalaya, Nagaland and Mizoram.
3. British Superintendent/Deputy Commissioner, His Powers (Executive, Supervisory and Judicial) and Position.
3. The Inner Line Regulation and its relevance in the changing socio-economic society of the tribes.
4. Traditional political Institutions (chiefships) in Meghalaya, Nagaland and Mizoram : Powers, Functions and Privileges/Position.
5. Administration of Justice in the Hill areas.
6. Administration of the Autonomous Hill Districts in North-East India : Autonomous District/Regional Councils: Organisation, Powers and working.

Contd/..

7. Rural Administrative Institutions in Meghalaya, Nagaland and Mizoram: Traditional Village Institutions/Village Councils - Composition, Powers and working.
8. North-Eastern Council : Its Organisation and Role.

## SUGGESTED READINGS

## CORE READINGS:

1. E.A.Gait, A History of Assam, Calcutta, Thacker spink, 1963.
2. A.G.McCall, Lushai Cavaliers, London, Luzac and Co.Ltd., 1949.
3. J.Shakespeare, Lushai - Kuki Clans, London, Macmillan and Co Ltd., 1942.
4. Neera Chatterjee, The Mizo Chief and His Administration, Aizawl, Tribal Research Institute.
5. N.E.Parry, The Lakhers, Aizawl, Tribal Research Institute.
6. V.V.Rao, A Century of Tribal Politics in North-East India, New Delhi, S. Chand and Company.
7. S.K.Chaube, Hill Politics in North-East India, Calcutta, Orient Longman, 1973.
8. Durga Das Basu, Introduction to the Constitution of India, New Delhi, Prentice Hall of India, 1985.
9. Animesh Ray, Mizoram: Dynamics of Change, Calcutta, Pearl Publishers, 1982.
10. M. Horem, Naga Polity, Delhi, D.K.Publishers.
11. O.F.Singh, Political Evolution of Nagaland, Delhi, Lancers Publications.
12. F.R.T. Gurdon, The Khasis, London, 1914.
13. Hamlet Barch, The History and Culture of the Khasi People, Calcutta, 1967.
14. V.V.Rao and Niru Hazarika, A Century of Government and Politics in North East India, New Delhi, S.Chand & Co., Vol. I (Assam), Vol. II (Meghalaya), Vol. III (Mizoram), Vol. III Forthcoming).
15. Hamlet Barch, Khasi Democracy.
16. S.K.Chattopadhyay, Tribal Institutions of Meghalaya, Gauhati Spectrum Publications, 1985.

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17. The Garo Law of Inheritance, Department of Anthropology, C.U.
18. A. Flayfair, The Garos, London, 1909.

ADDITIONAL READINGS:

1. Report of the Commission on the Hill Areas of Assam, 1965-66 (Under the Chairmanship H.V.Pataskar, Ministry of Home Affairs).
2. Report of North-East Frontier (Assam) Tribal and Excluded Areas Sub-Committee, 1947, 2 Vols., Delhi. The Manager of Publications, 1950.
3. Constituent Assembly Debates Vol. IX. No.29 September 16, 1949 and Vol. X No. 27 September 1949.
4. A.Mackenzie, History of the Relations of Government with the Hill Tribes of the North-East Frontier of Bengal, 1949.
5. M.L.Bose, Historical and Constitutional Documents of North-Eastern India, Delhi, Concept Publishing Co., 1979.
6. S.M.Dubey, Ed., North-Eastern India - A Sociological study, Delhi, Concept Publishing Co., 1978.
7. Acts of the District Councils of the Garo Hills, Khasi and Jaintia Hills.
8. H. Thansanga, Government and Politics in Mizoram, (Ph.D. thesis (Unpublished), Gauhati University, 1982.

ARTICLES:

1. B.Fakem, The Changing Power Structure of the Political Institution of Chieftainship in Mizoram (in) The Journal of the North-East India Council for Social Science Research, Vol. V. No. II, Shillong, 1981.
2. R.N.Frasad, District Council : Composition, Powers, Functions and Working (in) Elements of Indian Constitution, Shillong North Eastern Hill University Publications, 1985.
3. R.N.Frasad, A study of village administration in Mizoram, The Indian Journal of Public Administration, October-December, 1983.

5:2:3(1)

(iii) Revised syllabus for B.Sc. Zoology  
(Pass and Honours) -

The Board of Under-Graduate Studies in Zoology framed the revised syllabus for B.Sc. Zoology (Pass and Honours) courses in its meeting held on the 19th August, 1986. The revised syllabus is placed before the Council for favour of consideration.

NORTH-EASTERN HILL UNIVERSITY  
SHILLONG

SYLLABUS  
OF  
B.Sc. ZOOLOGY  
1987

<u>PAPER</u>	<u>PAGE</u>
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PAPER-II : CHORDATA, COMPARATIVE ANATOMY, CYTOLOGY, GENETICS, EMBRYOLOGY, EVOLUTION, ADAPTATION AND PHYSIOLOGY .....	4
PAPER-III : PRACTICAL .....	8
PAPER-IV : CELL BIOLOGY, EVOLUTION AND GENETICS .....	11
PAPER-V : BIOCHEMISTRY, PHYSIOLOGY AND ENDOCRINOLOGY..	13
PAPER-VI : BIOSYSTEMATICS, DEVELOPMENTAL BIOLOGY, ENVIRONMENTAL BIOLOGY AND ECONOMIC ZOOLOGY..	15
PAPER-VII : PRACTICAL .....	17
PAPER-VIII : PRACTICAL .....	19

B.Sc. ZOOLOGY SYLLABUS

Paper I - Non-chordata, Zoogeography and Taxonomy

Maximum marks : 100

Time : 3 hours

Part I: Lower Non-chordata and Zoogeography

1. Protozoa- General characters and classification upto orders; Nutrition in protozoa; Locomotion in protozoa; Reproduction in protozoa; Economic importance of protozoa.
2. Porifera-General characters and classification upto orders; General systems in Porifera; Spicules in Porifera; Reproduction and development of Sycon.
3. Coelenterata- General characters and classification upto orders; Structure and Life history of Aurelia; Polymorphism in Siphonophora; Coral reefs and theories of coral reef formation; Ctenophors-Anatomical peculiarities and phylogeny.
4. Platyhelminthes-General characters and classification upto orders; Life history and pathogenicity of Fasciola and Taenia.
5. Nematelminthes-General characters; Life history and pathogenicity of Wuchereria bancrofti and Ancylostoma duodenale; parasitic adaptations in helminthes.
6. Zoogeography and Paleo Zoology-Zoogeographical realms with their characteristic fauna; Barriers and means of animal distribution; Geological eras and periods with examples of dominant fauna.

Part II: Higher Non-chordata and Taxonomy.

1. Annelida - General characters and classification upto orders; Morphology and reproduction in Nereis and Leech; Comparative account of Excretory system in Annelida.
2. Mollusca-General characters and classification upto orders; Comparative account of Respiratory, Reproductive and Nervous systems in Pila, Unio and Sepia; Torsion and Detorsion in Gastropoda; Foot modifications in Mollusca.

3. Arthropoda- General characters and classification up to orders; Comparative account of Respiratory, Excretory and Reproductive systems in Arthropoda with reference to Prawn, Cockroach and Scorpion; Larval forms of crustacea; Parasitic crustaceans with affinity of Onychophora; Elementary knowledge of Insect pests and pest control.
4. Echinodermata- General characters and classification upto Classes; General organisation and morphology of starfish; larval form.
5. Minor Phyla- General introduction.
6. Taxonomy-Principles of Zoological Nomenclature and classification.

Suggested Readings:

- Allee, W.C. and K.P. Schmidt: Principles of Animal Geography. John Wiley, New York, 1951.
- Chandler, A.C. :An Introduction to Parasitology. Wiley Eastern Private Ltd., New Delhi 1961.
- Hyman, L.H. :The Invertebrates 6 Vols. Mc.Graw Hill, New York, 1951-1967.
- Jordan, E.L. & P.S. Verma :Invertebrate. Zoology. S.Chand, New Delhi, 1978.
- Mayer, E. :Principles of Systematic Zoology. Tata Mc.Graw Hill Publishing Company Ltd., New Delhi, 1969.
- Mukherjee, D. :A Text book of Zoology. The New Book Stall, Calcutta, 1954.

- Parker, T.F. & Haswell,  
W.A. : A Text Book of Zoology. Vol.  
1 revised by A.J. Marshall.  
Mc Millan, 1962.
- Prasad, S.N. : A Text book of Invertebrate  
Zoology. Kitab Mahal, Alla-  
habad, 1974.
- Simpson, G.G. : Principles of Taxonomy.  
Oxford and IBH India, 1965.
- Srivastava, M.D.L. and  
U.S. Srivastava : A Text book of Invertebrate  
Zoology. Central Book Depot,  
Allahabad, 1962.

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Paper II - Chordata, Comparative anatomy, Cytology,  
Genetics, Embryology, Evolution, Adaptation  
and Physiology.

Maximum marks: 100

Time : 3 hours.

Part I: Chordata and Comparative anatomy

1. Protochordata - General characters and classification upto orders; Salient features and affinities of Balanoglossus and Amphioxus/Branchiostoma; Feeding mechanisms in protochordates; Retrogressive metamorphosis in Urochordata.
2. Cyclostomata - Salient features of Agnatha; Comparison between Myxine and Petromyzon.
3. Pisces - General characters and classification upto orders; Dipnoi: General organisation and affinity; Accessory respiratory organs and Swim bladders; Morphology and anatomy of Lates.
4. Amphibia - General characters and classification upto orders (Living orders only); Parental care; Neoteny; Origin of Amphibia.
5. Reptilia - General characters and classification up to orders; Anatomical peculiarities and affinities of Sphenodon; Distinction between poisonous and non-poisonous snakes; poison apparatus and biting mechanism; Morphology and anatomy of Calotes.
6. Aves - General characters and classification upto orders; Distinction between Ratitae and Carinatae; Flight and perching mechanisms; Migration; origin; Morphology and anatomy of Pigeon.
7. Mammalia - General characters and classification up to orders; General characters and affinities of Monotremata and Marsupialia.

Part II - Cytology, Genetics, Embryology, Ecology,  
Evolution, Adaptation and Physiology

1. Cytology - Structure, function and types of Chromosomes; Cell divisions.
2. Genetics - Mendelism and Mendel's laws of inheritance; Linkage and Crossing over; Sex determination; Basic concepts of Gene and mutation.
3. Embryology-Gametes, Fertilization and cleavage; Gastrulation in Amphioxus, Frog and Chick up to the formation of three germinal layers; foetal membranes in birds.
4. Ecology - Basic concepts of the eco-system; A preliminary understanding of Abiotic factors and Biotic factors; Simple food chains; Environmental pollution.
5. Evolution - Concept of Evolution; Evidences of Evolution; Lamarkism and Darwinism.
6. Adaptation - Types of adaptations with special reference to Desert adaptation, Volent adaptation and Aquatic adaptation.
7. Physiology - Elementary knowledge of Digestion, Blood, Respiration, Excretion and Endocrine glands.

Suggested Readings :

- |   |   |
|---|---|
| Attenburg, Edgar.                         | : Genetics. Oxford and IBH, New Delhi, 1970.  |
| Agarwal, R.A., A.K. Srivastava & K. Kumar | : Text Book of Animal Physiology and Biochemistry. S. Chand & Co., New Delhi, 1978. |
| Balinsky, B.I.                            | : Introduction to Embryology. W.B. Saunders Company, Philadelphia.                  |

- Colbert, E.H. : **Evolution of the Vertebrates; A History of the Backboned Animals through time.** Wiley Eastern, New Delhi, 1970.
- Jordan, E.L. & P.S. : **Chprdata Zoology and Elements of Animal Physiology.** S. Chand, Varma New D lhi, 1978.
- Odum, Eugene F. : **Foundamentals of Ecology.** W.B. Saunders, Philadelphia, 1971.
- W.A. Haswell & Parker ; **A Text book of Zoology, Vol. T.F. II** revised by A.J. Marshall, Mc. Millan, 1962.

Additional Readings :

- Alec, W.C., Emerson, : **Principles of Animal Ecology.** Park and Chmidt W.B. Saunders, Philadelphia, 1949.
- Dobzhansky, Theodosius : **Genetics of the Evolutionary process.** Columbia University Press, 1970.
- Ford, E.D. : **Mondelson and Evolution.** Mathwen and Science Paperbacks, London, 1965.
- Gardner, E.G. : **Principles of Genetics.** Wiley Eastern, New Delhi, 1968.
- Mody, P.A. : **Introduction to Evolution.** Kalyani Publication, Ludhiana, 1970.
- Swen, D.F. : **What is Ecology.** Oxford University Press, London, 1974.

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- Sedgwick, Adam : Student's Text Book of Zoology,  
Central Book Depot, Allahabad  
1972.
- Swanson, C.P. Timothy, : Cytogenetics, Prentice Hall,  
Marg and W.J. Young. New Delhi, 1973.
- Sinnoti, D.W., L.C. : Principles of Genetics, Tata  
Dunn and P. Dobzhansky McGraw Hill, 1958.
- Simpson, G.G. : Major Features of Evolution.  
Simon and Schuster, New York,  
1958.
- Simpson, G.G. : Meaning of Evolution : A study  
of the History of Life and  
its significance for Man.  
Oxford and IBH, Calcutta, 1967.

Part III Practical

Part - I

Maximum marks - 50

Time - 6 Hours.

Practical ExaminationDistribution of Marks.

Major dissection	12
Minor dissection/mounting	8
Identification (5 Specimen x 2) (5 slides x 2)	20
Submission/Laboratory Record	10

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 Total=50

## 1. External Morphology and Dissection :-

- 1) External morphology of Pila, Unio, Sepia, Cockroach and Prawn.
- 2) Urinogenital System of Leech.
- 3) Nervous system of Squilla.
- 4) Nervous system of Pila and Sepia; ganglia of Unio.
- 5) Nervous system of cockroach and Prawn.
- 6) Reproductive system of Cockroach - male and female.

## 2. Mounting and stained preparations :-

Nephridium of Leech, Septal nephridia, Setae and ovary of Earth-worm; Parapodia of Nereis; Ospharidium and Radula of Pila; Statocyst and appendages of prawn; Salivary apparatus of Cockroach; suitable macroscopic and microscopic materials from non-chordates.

3. Identification :-

1. Representative specimen of different orders of non-chordates.
2. Histological slides of non-chordates.

## 4. Submission :-

- 1) Slides - not less than 10
- 2) Laboratory Record.

Part II

Maximum marks : 50

Time : 6 hours

<u>Practical Examination</u>	<u>Distribution of marks</u>
1) Dissection	12
2) Chromosomal Preparation	8
3) Identification (Museum specimens 3x2) (Slides 2x2½) (Bones 2x2)	15
4) Submission	10
5) <u>Viva Voce</u>	5
<hr/>	
Total = 50	

## 1. External Morphology and Dissections :

- 1) External morphology of Scoliodon, Calotes/Uromastix, Bird and rat/Guinea pig.
- 2) Afferent and Efferent Bronchial Vessels of Scoliodon.
- 3) Cranial nerves of Scoliodon - V, VII, IX & X.
- 4) Internal Ear of Scoliodon.
- 5) Digestive and **U**rinogenital system of Scoliodon.
- 6) Cranial nerves of toad - IX & X.
- 7) Arterial and urinogenital systems of Calotes/Uromastix.
- 8) Demonstration of different systems of a bird.
- 9) Digestive, Arterial and Urinogenital systems of a mammal.

## 2. Permanent stained preparations :-

Epithelial tissues, striated and non-striated muscles; Blood films of vertebrates; cycloid, ctenoid and placoid scales of fishes; Filoplumes, barbs and pecten of birds.

## 3. Cytological preparations :-

Preparation of chromosomes from any biological material.

4. Identification :-

- 1) Museum specimens; Representative animals of different orders of chordates.
- 2) Osteology; Disarticulated bones of Varanus, Fowl/Pigeon, Guinea pig/Rabbit, poisonous and non-poisonous snakes, skull of Varanus, Fowl/Pigeon and dog/rabbit.
- 3) Histological slides:- Different parts of alimentary canal, lungs, liver, kidney, pancreas, gonads, epithelial tissues, thyroid, pituitary, blood and cartilage/bone of frog and mammals.
- 4) Embryological slides of frog and chick up to 3 germinal layers.

5. Submission :-

- 1) Slides not less than 10.
- 2) Articulated/disarticulated skeleton of any vertebrate..
- 3) Laboratory Record.
- 4) Field Report.
- 5) Collection of specimen and submission (students are expected to go on at least one field trip to places of Zoological interest and submit field report accordingly).

5:2:3:(13)

Paper IV : Cell Biology, Evolution and Genetics.

Maximum marks - 100

Time - 3 Hours.

(Total 5 questions to be answered)

1. Cell Biology; Structure and function of plasma membrane  
Cilia, flagella, centriole, endoplasmic reticulum, golgi  
body, lysosome, ribosome, mitochondria, nuclear membrane,  
and nucleolus; Special types of chromosomes; Gene con-  
cept; Membrane transport.
2. Evolution; Modern concept of Evolution; Mutations and  
their role in Evolution; Isolation, Isolating mechanisms  
and their role in Evolution : Species concept and speciation  
origin of life.
3. Genetics: Genetic interactions; Multiple factors inheri-  
tance; Multiple alleles and blood groups in man; Linkage  
maps; Sex linked inheritance.
4. Comparative anatomy of vertebrate systems Integumentary  
digestive, respiratory, heart and sortic arches, and  
urinogenital systems.

Suggested Readings :

- Attenburg, C. : Genetics. Oxford & IBH publication  
New Delhi, 1970.
- Gain, A.D. : Animal species and their Evolution  
Butchinson University Library,  
London, 1963.
- De Robertis, E.D.P. : Cell Biology. W.B. Saunders,  
Philadelphia, 1970.

Additional Readings :

- Dobzhansky, Theodosius : Genetics of the Evolution Pro-  
cess. Columbia University Press,  
1970.

- Barber, E.D. : Cytogenetics : An Introduction.  
Tata McGraw Hill, New Delhi,  
1974.
- Mody, P.A. : Introduction to Evolution  
Kalyani Publication, Ludhiana,  
1970.
- Swanott, E.N., L.C.Dunn, : Principles of Genetics, Tata  
and T. Dobzhansky McGraw Hill, New Delhi, 1958.
- Strickberger, M.W. : Genetics. McMillan, New York, 1976
- Swanson, C.P., Timothy  
Merz and W.A. Young : Cytogenetics. Prentice Hall, New  
Delhi, 1973.
- White, M.J.D. : Chromosomes. Methuen, London, 1961.

5:2:3(15)

Paper V: Biochemistry, Physiology and Endocrinology

Maximum marks - 100

Time - 3 Hours.

1. Biochemistry: Structure and Properties of Carbohydrates, Proteins, and Fats, Glycolysis, Krebs cycle, Oxidative phosphorylation; Enzyme classification and mechanism of action; Vitamins; Structure and DNA & RNA; Replication; Genetic code; protein synthesis; Buffer and pH.
2. Physiology : Mechanism and regulation of Digestion and absorption; Blood coagulation; Breathing Cardiac cycle; Structure and contraction of skeletal muscle; Structure of neurons and conduction of nerve impulse.
3. Endocrinology: General characters of hormones and mechanism of hormone action; Elementary knowledge of the structure and functions of the following endocrine glands - Hypothalamo-hypophyseal complex, thyroid, adrenal, testis, ovary, pancreas, thymus, parathyroid and pineal; Elementary knowledge of pheromones.

Suggested Readings:

- Agarwal, R.A., A.K.Srivastava : A test Book of Animal  
and K. Kumar Physiology and Biochemistry.  
S. Chand & Co., New Delhi, 1978.
- Agarwal, V.K., F.S. Varma : Animal Physiology. S. Chand  
& B.S. Tyagi & Co., New Delhi, 1978.
- Turner, C.D. and J.T. Bagnara : General Endocrinology, 6th  
Edition. W.B. Saunders Company,  
Philadelphia.

Additional Readings :

- Bel, G.H.J., Narman : A Text Book of Physiology and  
Davidson and D.E. Smith Biochemistry. E.L.B.S., London.
- Dowben, Robert. M : General Physiology, Harper and  
Row, New York, 1968.
- Mahler, H.H. and Eugene : Basic Biological Chemistry.  
H. Cordesa Harper and Row, New York, 1968.
- Harper, Harld A., V.W. : Review of Physiological Chemis-  
Rodwell and P.A. Mayers try. Large Medical Publications,  
Californai, 1979.
- Williams, R.H. : Text Book of Endocrinology,  
6th Edition. W.B. Saunders  
Company, (1981).

5:2:3:(17)

Paper VI. Biosystematics, Developmental Biology,  
Environmental Biology and Economic Zoology

Maximum marks : 100

Time : 3 hours.

(Three questions to be attempted from part I. and two from part II)

Part I

Biosystematics and Developmental Biology :-

Basic concepts and scopes of Biosystematics; terms and definitions; theories of classification; Material basis of morphotaxonomy, chemotaxonomy and cytotaxonomy; International code of Zoological nomenclature.

Gametogenesis; fertilization and egg activation including parthenogenesis; Mechanism and significance of cleavage; Fate maps and morphogenetic movements; Germ layers and their fate; Types and significance of gastrulation; Fetal membranes and types of placenta in mammals.

Part II

Environmental Biology and Economic Zoology :-

Basic concept and scope of Biosphere; Man and environment; Basic concept of renewable and non-renewable resources; Social forestry; Population explosion; Sericulture; Agriculture; Pest management.

Suggested Readings :

Balinsky, B.I.

: Introduction to Embryology. W.B. Saunders Company, Philadelphia, 1976.

- Derill, N.J. and Karp : Development. Tata McGraw Hill, New Delhi, 1978.
- Mayer, E., : Principles of Systematics. Tata McGraw Hill Publishing Company Ltd., New Delhi, 1969.
- Pattern, B.M. : Early Embryology of Chick. Tata McGraw Hill, New Delhi, 1957.
- Srivastava, P.D. : Economic Zoology: The Role of Animal Life in Human Welfare, Agriculture and Industry. Commercial Publication, New Delhi, 1977

Additional Readings :-

- Commoner, Barry, : Science of Survival. Ballentir Books, New York, 1966.
- Dotwyler, T.N. : Man's Impact on Environment. McGraw Hill, New York, 1971.
- Ehrlich, A.N., P.H. and Ehrlich : Population Resources, environment Issue in Human Ecology. W.H. Freeman, San Francisco, 1972.
- Gilchrist, F.G. : A survey of embryology. McGraw Hill, New York, 1956.

5:2:3(19)

Paper VII Practical

Maximum marks : 100

Time : 6 hours

Practical Examination	Distribution of Marks
1) Physiology Experiment	30
2) Cytological Experiment	20
3) Spooting (Physiology & Cytology)	20
4) <u>Viva Voce</u>	20
5) Class Record	10
	<hr/>
	Total = 100

1. Physiological Experiments :-

- 1) Determination of Amylase activity of human saliva and effect of temperature and dilution.
- 2) Test for Carbohydrates, Proteins and Fats.

Tests for Proteins.

- 1) Biuret test
- 2) Ninhydrin test
- 3) Xanthoproteic reaction
- 4) Millon's test
- 5) Pauly's test

Test for Carbohydrates.

- 1) Molisch's test
- 2) Benedict's test
- 3) Barfoed's test
- 4) Iodine test
- 5) Anthrone test.

Tests for fats

- 1) Solubility test for Lipids
- 2) Tests for fatty acids
- 3) Tests for glycerol.

Ref :- An introduction to Practical Biochemistry by  
David T. Plumme.

- 3) Detection and separation of Amino acids by paper Chromatography.
- 4) Recording of normal heart beat and action of Adrenalin, Acetylcholine and temperature.
- 5) RBC and WBC counting by Haemocytometer
- 6) Determination of Blood groups and Rh factor
- 7) Determination of Haemoglobin concentration of the blood
- 8) Preparation of Haemin crystals from blood.
- 9) Oxygen consumption of fish by titration.
- 10) Demonstration of Endocrine glands of a mammal.
- 2) Cytological Experiments :-
  - 1) Study of Mitosis and Meiosis
  - 2) Study of Polytene chromosomes
  - 3) Study of sex chromatin.

5:2:3(21)

Paper VIII practical

Maximum marks : 100  
Time : 6 hours

Practical Examination . Distribution of Marks

1) Ecological Experiments	20
2) Developmental Biology	20
3) Microtomy	20
4) Spotting	15
5) <u>Viva Voce</u>	15
6) Submission of slides, field report, specimens and laboratory records.	10

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Total=100

1. Ecological Experiments

- 1) Measurement of Natural Population by the quadrat method.
- 2) Measurement of Communities with special reference to the density, Frequency and abundance.
- 3) To study the physical characteristics (temperature, texture and colour) of the soil.
- 4) To compare the chemical characteristics (moisture, carbohydrate content, nitrate content and base-difficiency) of the given soil samples by the use of rapid tests.
- 5) Measurement of  $p^H$  of water and soil samples from different environment.
- 6) Measurement of  $EO_2$  by titration of fresh water both steady and running.

2. Developmental Biology Experiments :-

- 1) Induce breeding and development of any fish/frog species (Students have to dissect our pituitary and prepare the necessary extract)
- 2) Study of slides of frog and chick development (whole mounts and sections).

- 3) Incubation and mounting of chick embryos.
- 4) Study of slides of gemmules of sponges, a sexual and sexual forms of Hydra and invertebrate larvae.
- 5) Study of life stages of insects.
- 6) Study of slides showing regeneration of Hydra or planaria.

3. Microtomy :-

Fixation, Impregnation, block preparation, section cutting, stretching, staining and mounting of the following tissues and their identification:- Intestine, stomach, Liver, kidney, lungs, Pancrease, ovary, testis, thyroid and adrenal.

5:2:4.2)

Annexure - 'A'

1. Title : Certificate Course in Linguistics
2. Objectives :
  - A. To introduce Linguistics as a discipline, to understand the structure of a Language.
  - B. To study language diversification, language change in historical and dialectal perspective.
  - C. To explain the inter-relationship between language, culture and society.
  - D. To explain the importance of Linguistics in terms of language acquisition, language learning and teaching.
  - E. To use Linguistics as an effective tool to study the structure of any language (Phonological, morphological, syntactic and semantic).
3. Duration:

Full time (one semester)  
12 lectures/week for 4 courses.

Part time (two semesters)  
6 lectures/week for 2 courses.
4. Eligibility : Any science or arts graduate of NCHU or any other University recognised by NCHU.
5. Leverage : Those who successfully complete the 'Certificate Course', will be eligible to join M.A. (Linguistics) of NCHU, as and when introduced, with waiver for Hons. as required qualification.

Contd/...

5:2:4(3)

6. No. of seats: 10 (provisional).
7. Admissions : As per NEHU rules.
8. Criteria of selection As per NEHU rules.
9. Venue : The course will be conducted by the Department of English, NEHU, Kohima.
10. Course fee : To be decided by the University.
11. Exam. Fee : To be decided by the University.
12. Course content : The Certificate Course in Linguistics shall consist of the following four courses :
- Course I (General Linguistics ) (75)
- Unit - A -
- (i) Definition of language, forms of language - Spoken and written, informal and formal.
- (ii) Definition of grammar, comparative philology and Linguistics. (15)
- Unit - B. -
- Brief history of grammar tradition, comparative philology and modern Linguistics. (15)
- Unit - C -
- (i) Language as a system of communication, communication model, code switching and code mixing.
- (ii) Language and Logic.
- (iii) Language and Philosophy (15)

Contd/...

5:2:4(A)

Unit - D -

(i) Branches of Linguistics - Descriptive, Historical, Applied, Psycholinguistics, Sociolinguistics, Anthropological Linguistics.

(ii) Aims and objects of Linguistic studies.

3. Brief introduction of the salient features of the following grammars - (15)

(i) TG grammar - Chomsky

(ii) Case grammar - Fillmore

(iii) Systematic grammar - Holliday

Course - II (Descriptive Linguistics) (75)

Unit - A - (Phonetics and Phonology).

(i) Linguistics - a hierarchical organisation

(ii) Phonetics - its branches, with emphasis on articulatory Phonetics.

(iii) Vowels and consonants

(iv) Phone, Phoneme, Allophone (30)

(v) Phonological study of a language.

Unit - B - (Morphology and Syntax)

(i) Morph, allomorph, Morpheme, word

(ii) Inflection and derivation

(iii) grammatical categories

(iv) Form-classes

(v) Phrase, clause, sentence and its types.

Negative and Passive transformation (30)

Unit - C - (Semantics)

(i) Relation between form and meaning

(ii) Change of meaning

(iii) Synonyms and Homonyms (15)

Contd/...

5:2:4(5)

Course - III ( Historical Linguistics and  
Dialectology)

Unit - A -

- (i) A survey of Historical Linguistics
- (ii) Language change - on the axes of time  
and place.
- (iii) Language Typology
- (iv) Language Families of the world (15)

Unit - B -

- (i) Language Families in India
- (ii) Indo-Aryan languages
  - (a) Old Indo Aryan
  - (b) Middle Indo Aryan
  - (c) New Indo Aryan.
- (iii) Dravidian languages
- (iv) Tibeto Burman and other families
- (v) Languages of NE Region (30)

Unit - C -

- (i) Survey of dialect studies
- (ii) Linguistics survey of India Grierson - A  
brief study.
- (iii) Dialectology - its technique and functions
- (iv) Dialect survey - procedure and marking system
- (v) Application of field methods in dialectology
- (vi) Dialect mapping (30)

Contd/.....

5:2:4(6)

Course - IV - (Sociolinguistics and Applied Linguistics) (75)

Unit - A -

- (i) Sociolinguistics and sociology of language, language, culture and society.
- (ii) Language behaviour and social stratification
- (iii) Social dialects, Pidgins and Creols. (15)

Unit - B -

- (i) Bilingualism, Diglossia
- (ii) Language standardisation
- (iii) Language policy (15)

Unit - C -

- (i) Linguistics and Language teaching
- (ii) Psychology of II Language learning
- (iii) Teaching English as a second language - methods
- (iv) Teaching language skills (30)

Unit - D -

- (i) Language acquisition in children
- (ii) Language and concept formation
- (iii) Language attitudes (15)

Note : The marks within bracket show the marks assigned to each unit for external examination.

13. Recommended texts :

- |  |               |
|--|---------------|
| 1. Language                              | L. Bloomfield |
| 2. Language                              | Edward Sapir  |
| 3. An outline of Descriptive Linguistics | Gleason       |
| 4. Historical Linguistics                | W.F. Lehman   |

Contd/...

5:2:4(7)

5. Language in Culture  
and Society Dell Hymes
6. Applied Linguistics H.G.Holliday
7. What is Linguistics : David Crystal
14. Library facility : At present the Library is just  
adequate to start the course.  
More copies of basic texts and  
references will be procured soon.
15. Mode of Examination: A full time course - at the end  
of semester-I  
(4 courses - 4 papers).  
B. Part time course - 2 courses -  
at the end of semester - I  
(C-1 and C-2).  
2 courses - at the end of  
semester - II (C-3 and C-4).
16. Evaluation : Total marks 400 (100 marks for  
each course)  
External examination - 75 marks  
Internal assessment - 25 marks  
100 marks  
for each course.
17. Date of commencement: March, 1987 (tentative).
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ALL INDIA & CENTRAL SERVICES EXAMINATIONS

COACHING PROGRAMME

(Preliminary Draft of the Scheme)

(1) Purpose :

The All -India and Central Services offer some of the most coveted job avenues to the young university graduates in the country today. There are constitutional provisions stipulating reservation quotas for scheduled tribes (and scheduled castes) for entry into these jobs. This notwithstanding, the representation of the Mizo Youth in the All-India and Central services remains infinitesimally small. This is primarily because the university graduates in Mizoram have been unable to equip themselves with a level of academic preparation needed to qualify in these examinations. This situation could be rectified if arrangements may be made to systematically train and coach qualified young men and women aspiring to enter into civil services.

With this end in view, the NEHU has decided to institute, under the aegis of its Department of Public Administration at the Mizoram Campus, arrangements for coaching and training of the young aspirants to civil services. These arrangements envisage coaching in a wide range of subjects included in the syllabuses of the various civil service examinations conducted by the UPSC.

(2) Background :

A Proposal to this effect was, at the behest of the Vice-Chancellor of the University, verbally placed before the first meeting of the BPGS in Public Administration held in Shillong on the 28th and 29th August, 1986.

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The same was ratified by the Board in the said meeting. It was further resolved that an outline of the scheme shall be circulated among the members of the Board; this is the first preliminary step in that direction.

The Document outlines, in broad and general terms, the core aspects of the coaching programme that shall be undertaken in pursuance of the above resolution. The idea, at this stage, is to project the relevant aspects with a view to portray the general mechanics of the scheme. Minuter details of the Scheme shall have to wait till specific guidelines from the University for organising the coaching programme become available; these shall inter alia include an indication regarding the funds which may be made available for the programme. We are given to understand that a coaching programme of the kind, which under the present scheme is envisaged for the MCHU's Mizoram Campus, is already running at the University's Shillong Campus. It should be of a considerable help, in finalising the details of the scheme at the Mizoram Campus, to get to know, for persons concerned in Shillong, the manner in which the coaching programme is being run on the Shillong Campus. In the meanwhile, efforts are underway to contact some of the universities which are running similar programme, these have been requested to furnish us with details of the manner in which they run their programmes; the idea being that, before we take the plunge, it might be advisable to exchange notes with those who have behind them some experience of running similar or identical programmes. Likewise, efforts are in progress to secure syllabuses of the relevant UPSC examinations.

Cont/..../

Pending the availability of these materials and guidelines, this document spells out the mode of obtaining faculty for the coaching programme; provides an indication of the various other aspects which shall need to be deliberated upon and sorted out in an appropriate forum; it also indicates what such a forum or machinery might be; and, finally, it provides an indication of the role of the Deptt. of Public Administration in regard to the scheme in question.

(3) The mode of obtaining faculty and the range of subjects:  
Quality of instruction - Central issue :

The faculty for coaching programme, as is the practice in the universities running these programmes elsewhere, shall be drawn from within the academic departments located on the Mizoram Campus. However, since the number of academic departments on this Campus is at present limited to just half a dozen, it would be necessary to go beyond the NEHU, Mizoram Campus, in search of the teaching talent of a requisite kind and caliber. The Pachhunga University College, with its highly qualified staff, could be one source, from outside the P.G. Campus, from where to draw teachers for the coaching programme. This would help to enlarge the range of subjects in which it might be possible to undertake coaching. Search for suitable teachers to undertake coaching could, in fact, be extended to other colleges (including the Law College) in Aizawl as well.

Of essence in this coaching programme shall be the quality of instruction which is imparted. For this reason, we should aim to confine coaching only to such subjects in respect of which teachers of the requisite caliber might be available. This would, no doubt, restrict the number of subjects in which it might be possible to organise coaching but, at the same time, this would guarantee quality instruction.

Contd/.../-

(4) Specific Aspects :

There are specific aspects of the coaching programme which shall require a detailed deliberation. These are listed below.

1. The determination of the subjects in which coaching shall take place and the detailed Modus operandi of teaching programme.

2. The determination of the constituencies from within which teachers for the coaching programme may be drawn and of the criteria on which individuals shall be selected for the programme.

3. Determining the scale of honoraria to be paid to teachers.

4. The requirements of books for the programme, developing a library, and the management of the Library.

5. The number of students to be admitted and criteria on which these students might be admitted.

6. The length of the coaching Programme.

7. Teaching hours.

8. The venue where coaching classes may be held.

9. Sources of funds for financing the coaching programme and management of funds.

Decisions on the aspects listed above shall determine the actual size and shape of the coaching programme.

(5) Standing Committee :

It is suggested that a Committee may be constituted to evolve guidelines in respect of the above matters. This may, in fact, be a Standing Committee which would periodically meet to advise the Department on various aspects of the coaching programme. This Committee may also, it is suggested, undertake the task of evaluating the performance of the scheme.

This Committee may have the Pro Vice-Chancellor, NEHU, Mizoram Campus, as its chairman. The members of the Committee may be drawn from within the academic and governmental circles in Aizawl, and outside, if necessary. This would be a central organ to direct and oversee the working of the scheme; as such its composition shall require a careful deliberation.

(6) Organisational Set-up :

As an agency entrusted with carrying out the coaching programme, the Department of Public Administration, Mizoram Campus, shall be responsible for the actual details of its operation and day to day functioning. Details of the organisational set-up which shall be established to implement the programme, will have to wait till necessary guidelines, in that behalf, become available from the University's Head Office at Shillong. It may, however, be observed that it is customary to create positions of Director and Deputy/Assistant Director to coordinate and direct such coaching programmes; these are honorary positions.

(vi) Draft syllabus for Certificate  
Course in Folkloristics -

The Steering Committee of the Centre for Literary and Cultural Studies held on the 4th December, 1986, considered and approved the syllabus for Certificate Course in Folkloristics. The syllabus has also been approved by the School Board of Social Sciences in its meeting held on the 10th December, 1986. The draft syllabus is placed at Annexure 'A'. The Centre proposes to introduce the Course from July, 1987.

The School Board of Social Sciences further decided to recommend to the Academic Council that the Centres may be allowed to start Degree Courses including M.Phil and Ph.D. and that the Ordinance may be suitably amended.

The matter is placed for consideration of the Council.

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CENTRE FOR LITERARY AND CULTURAL STUDIES  
NORTH-EASTERN HILL UNIVERSITY

CERTIFICATE COURSE IN FOLKLORISTICS  
SYLLABUS

(Approved by the Steering Committee in its meeting held on 4 December 1986 and by the School Board of Social Sciences in its meeting on 10, December 1986).

**Objective:** Folkloristics is the scientific study of folklore, It includes more than simply the collection of tales etc. and antiquarian reporting. It has now grown to be a rigorous intellectual discipline with attempt to apply theory and method to the materials of folklore.

With appropriate scholastic training in theory and methods of folkloristics, a scholar can contribute, through research on folklore, in studies in other social science disciplines, such as History, Anthropology, Philosophy. The Literary potential of folklore studies has long since been accepted, as many of language departments of Indian Universities have included local folk literature in their syllabi. It's potential for use in studying social formations is also being increasingly recognised.

In North-East India, where our University is situated, with its rich folk cultural heritage, such a course is deemed to be worthwhile in studying indigenous literatures and cultures. It is also expected to help in generating awareness among students and scholars about the cultural heritage and true history of the people of the region.

Keeping this in view, the Centre for Literary and Cultural Studies proposes to introduce a Certificate Course in Folkloristics. The course will provide perspective in the scientific study of the folklore material with exposure to concepts and methods and familiarise the student with the rich treasure of folklore materials of north-east India, especially of Meghalaya, Mizoram and Nagaland.

Eligibility: Any student with a Bachelor degree will be eligible for offering the course. Preference will, however, be given to students with degrees in social science disciplines and languages.

Faculty: Since the course is conceived as a School level course, faculty members from other social science disciplines and language departments may be inducted. The Centre's faculty will be the core faculty.

SEATS	-	Maximum 20
Duration	-	One Semester.
Marks	-	Each Course 100.

#### COURSE I                      ELEMENTS OF FOLKLORISTICS

Objective : The course will initiate the students to the theories and methods of the Science of Folklore.

Contents : What is Folklore/ Folklore and Folkloristics/ Types of Folklore- Literary, Linguistics, Scientific and Action/Major Genres/Major methods.

#### Readings:

1. M.S.Edmonson,                      Lore:An Introduction to the Science of Folklore.
2. K.Clarke and M.Clarke,                      Introducing Folklore.
3. Alan Dundes,                      The Study of Folklore,
4. M.Islam,                      Folklore: The Pulse of the People
5. J.Handoo,                      Current Trends in Folklore.
6. Maria Leach,                      Standard Dictionary of Folklore, Mythology and Legend.
7. A Krappe,                      The Science of Folklore.

#### COURSE II:                      FOLKLORE STUDIES IN NORTH-EAST INDIA

Objective: This course will familiarize the student with the studies made on Folklore in North-East India vis-a-vis the current trends in Folklore research.

Contents : Folklore and Folklife/Collected Genres of Folklore/Literary and other types/Studies made.

Readings :

1. I.M.Simon, Khasi Tales and Beliefs.
2. H.Bareh, Khasi Fables and Folktales.
3. Mrs. Rafy, Khasi Folktales.
4. H.Bareh, A Short History of Khasi Literature.
5. P.R.T.Gurdon, The Khasis.
6. D.S.Rongmuthu, The Epic Lore of the Garos.
7. D.S.Rongmuthu, Garo Folktales.
8. M.S.Jangma, History of Garo Literature.
9. Playfair, The Garos.
10. N.E.Parry, Lushai Customs and ceremonies.
11. Shakespear, The Lushai- Juki Clans.
12. J.P.Mills, Folk Stories in Lhota Naga.
13. S.Arokianathan, Tangkul Folk Literature.
14. J.P.Mills, The Ao Nagas.
15. J.P.Mills, The Lhota Nagas.
16. J.P.Mills, The Rengma Nagas.
17. Hutton, The Angami Nagas.
18. Hutton, The Sema Nagas.

COURSE-IV : FIELD TECHNIQUES

Objective : The course will familiarise the student with the general techniques of field research in folklore.

Contd/...5/-

Content: Folklore material/Collected Genres/Studies.

Readings:

1. P.Goswami, Essays on Folklore and Culture of North-East India
2. S.N.Barkataki, Tribal Folktales of Assam.
3. B.N.Datta, Bibliography of Folklore Material of Assam and Adjoining Areas
4. Soumen Sen (Ed), Folklore in North-East India.
5. B.N.Datta, Focus on Folklore in North-East India
6. P.Goswami, Folk Literature of Assam
7. P.Goswami, Ballads and Tales of Assam
8. V.Elwin, Myths of North-East Frontier of India
9. M.M.Brahma, Folk Songs of the Bodos.
10. T.K.Niyogi, Folktales and Myths of Riang and Tripuri Communities.

Folklore Sections of the following Monographs

1. Lyall and Stack, The Mikirs.
2. Hudson, The Meiteis of Manipur.
3. Shaw, Thadou Kukis.
4. Spitt, A Historical and Descriptive Account of the Kachari Tribes of Assam with Specimens of Tales and Folklore.

COURSE III. FOLKLORE OF MEGHALAYA, MIZORAM AND NAGALAND

Objective: The course will familiarize the student with the rich folklore material of Meghalaya, Mizoram and Nagaland, the three states covered by North-Eastern Hill University. This will be a part of studies in Folklore of North-East India.

Contd/...3/-

Contents : Collection/Classification and Processing/  
Indexing/Reporting.

Readings :

1. K.S.Goldstein, A Guide for Field workers in Folklore.
2. M.Clarke and M.Clarke, Folklore Reader.
3. P.V.Young, Scientific Social Surveys and Research.
4. W.E.Richard, Studies in Folklore.
5. S.Sengupta, A Guide to Field Study.
6. D.Choudhury, Methodology in Folklore Research.

M.Sc Course in Zoology

## ADMISSION REQUIREMENTS

Candidates who have passed B.Sc. Honours (Three Year Degree) Examination of the North Eastern Hill University or any other Institution considered equivalent by NEHU, with Zoology as the main subject and Chemistry as one of the subsidiary subjects will be eligible for admission to M.Sc. course in Zoology at NEHU. The mode of selection of candidates will be decided by the department in addition to the rules of the University.

## SYLLABUS

M.Sc. Zoology syllabus consists of 24 papers including 12 theory papers of 100 marks each and 12 practical papers of 50 marks each. The papers will be taught in four semesters in two years. Each semester will have three theory and three practical papers as detailed below.

## EVALUATION

25% of the total marks of each paper will be evaluated internally during the semester following the procedure as prescribed from time to time. Rest 75% will be examined at the end of the semester by external evaluation. Examination of each theory paper will be of three hours and each practical paper of four hours duration during end semester examination.

A student is expected to score 35% out of the internal assessment marks in each paper to be eligible to appear in the end semester examination.

## COURSE DISTRIBUTION

## Semester - I

- Z- 101 Animal Physiology (Theory)
- Z- 102 Animal Physiology (Practical).
- Z- 103 Cell and Molecular Biology (Theory)
- Z- 104 Cell and Molecular Biology (Practical)
- Z- 105 Concepts of Animal Development (Theory)
- Z- 106 Concepts of Animal Development (Practical)

## Semester - II

- Z- 201 Basic Biological Chemistry (Theory)
- Z- 202 Basic Biological Chemistry (Practical)
- Z- 203 Genetics and Evolution (Theory)
- Z- 204 Genetics and Evolution (Practical)
- Z- 205 Biosystematics and Biostatistics (Theory)
- Z- 206 Biosystematics and Biostatistics (Practical)

Semester - III

- Z- 301 Animal Ecology (Theory)
- Z- 302 Animal Ecology (Practical)
- Z- 303 Parasitology (Theory)
- Z- 304 Parasitology (Practical)
- Z- 305 Special Paper-I (Theory)\*
- Z- 306 Special Paper-I (Practical)\*

Semester -IV

- Z- 401 Endocrinology and Histochemistry (Theory)
- Z- 402 Endocrinology and Histochemistry (Practical)
- Z- 403 Fish Biology (Theory)
- Z- 404 Fish Biology (Practical)
- Z- 405 Special Paper-II (Theory)\*
- Z- 406 Special Paper-II (Practical)\*

\*Special Papers Offered:

- A. Limnology
- B. Biochemistry and Adaptation
- C. Cytogenetics
- D. Developmental Biology
- E. Entomology
- F. Parasitic Helminthology.

Z-101 ANIMAL PHYSIOLOGY (Theory)

Unit 1: History and scope of Physiology

Nutritional patterns in animals, Digestive enzymes and the regulation of their secretion in mammals, mechanism of digestion and absorption of different food materials, Vitamins.

Respiration: Respiratory organs; Mechanism of breathing and its regulation in mammals; Respiratory pigments

- Unit 2: Transport System: Types of circulatory systems, Physiological types of hearts; cardiac cycle and its regulation; composition and functions of blood; blood volume; Haemopoiesis; Blood coagulation; Blood pressure; Blood groups; O<sub>2</sub> and CO<sub>2</sub> transport, Oxygen equilibrium curve; Bohr effect and Root effect.
- Unit 3: Nervous System: Central and peripheral nervous systems; Structure of neuron; conduction of nerve impulse; resting potential; action potential; calculation of resting and action potential; synaptic transmission; mechanism of vision; Bioluminescence.
- Unit 4: Muscle: Types of Muscles; ultrastructure and chemical composition of skeletal muscle; mechanism of muscle contractions energy supply and heat production during muscle contraction.
- Unit 5: Excretion: Excretory products; Evolution of excretory system; structure of kidney and nephron; production of urine and regulation of excretion; Acid-base balance; Homeostasis.

Z-102 ANIMAL PHYSIOLOGY (Practical)

1. Comparison of RBC number in blood of different vertebrates.
2. Comparison of WBC number in blood of different vertebrates.
3. Comparison of Hb concentration in blood/<sup>of</sup> different vertebrates.
4. Preparation of hemin crystal from blood of different vertebrates.
5. Measuring blood pressure under different physiological conditions.
6. Recording of heart beat and effect of different physical and chemical factors on vertebrate heart beat.
7. Identification of blood groups.
8. Estimation of casein content in milk.
9. Estimation of ascorbic acid content in milk, lemon, orange, tomato.

Contd./.../-

10. Estimation of glycogen content in liver of any vertebrate.
11. Recording of muscle contraction and effect of load.
12. Digestive actions of different digestive glands on food material
13. Absorption of food materials in different parts of the alimentary canal of any vertebrate.
14. Determination of the rate of oxygen consumption from water by an aquatic animal.
15. Determination of respiratory quotient (R.Q) of an air breathing animal
16. Demonstration of calibration of Warburg respirometer.
17. Estimation of the rate of oxygen consumption by animal tissues using Warburg respirometer and effect of inhibitors.

Suggested Readings:

1. Keale, C.A. & Neil, E. (1963) Season Wright's Applied Physiology.
2. Prosser, C.L. (1984) Comparative Animal Physiology.
3. Hear, W.S. (1984) General and Comparative Physiology.
4. Martin, D.W. (1981) Harper's Review Biochemistry

Z-103 CELL AND MOLECULAR BIOLOGY (Theory)

- Unit 1: Cellular structure and organization of prokaryotes (bacteria, virus, blue green algae) and eukaryotes. Detailed structural organization and functional aspects of :  
Plasma membrane and cell surface; mitochondria; ribosome; lysosomes; Golgi complex; chloroplasts; nucleolus.
- Unit 2: Cytoskeleton- microtubules and microfilaments, microtubular organelles (centrioles, cilia etc); Cell cycle; mechanism of mitosis and meiosis- synapses, synaptonemal complex, crossing over, anaphase movement; basic ideas about autoradiography.
- Unit 3: Genomes in prokaryotes and eukaryotes; DNA as genetic material; Information flow; Chromatin-types, structure, function and chemical composition, chromosomal proteins; sex chromatin;

Contd/.../-

Unit 4: DNA- detailed structure, physico-chemical properties; circular DNA; single stranded DNA; left handed DNA; DNA replication; DNA repair; transcription-RNA polymerase, processing of RNA, reverse transcription.

Unit 5: RNA- Types and structure of m-RNA, t-RNA, and r-RNA; genetic code; mechanism of protein synthesis; Regulation of gene expression (operon); Plasmids and basic ideas about genetic engineering; Structure and function of antibody and interferon.

#### Z-104 CELL AND MOLECULAR BIOLOGY (Practical)

1. Preparation of solution/fixatives of different normality molarity and dilutions for cytological work.
2. Isolation and staining of mitochondria from mammalian liver.
3. To stain and study the sex chromatin in human buccal cavity cells.
4. Study of mitosis in onion root tip/bone marrow cells.
5. Study of meiosis in grass hopper testis.
6. Preparation and study of giant chromosomes from chironomid larvae.
7. To study the structural differences in prokaryotic and eukaryotic cells.
8. Study of the absorption maxima of purine/pyrimidine bases, DNA, protein.
9. Preparation and study of beaded models of nucleosides, nucleotides, amino acids, and proteins.
10. Extraction of nucleic acids from mammalian liver.
11. Colorimetric estimation of DNA.
12. Colorimetric estimation of RNA.
13. To study the effect of temperature on  $A_{260}$  by DNA.
14. Demonstration of polyacrylamide gel electrophoresis of proteins

#### Suggested Readings:

1. DeRobertis, E.D.P. and DeRobertis, E.M.F. (1980)- Cell and Molecular Biology.
2. Thorpe, N.D. (1984)- Cell Biology.
3. Saenger, W. (1984)- Principles of Nucleic Acid Structure,
4. Watson, J.D. (1980) Molecular Biology of the Gene.
5. Davidson, J.N. (1977)- Biochemistry of the Nucleic Acids.
6. Lewin, B. (1980)- Gene Expression, Vol. I-III.
7. Mainwaring, W.I.P., Parish, J.H., Fickering, J.D. and Mann, N.H. (1982)- Nucleic Acid Biochemistry and Molecular Biology

Z-105 CONCEPTS OF ANIMAL DEVELOPMENT. (THEORY)

Introduction to perspectives of Development, Embryology, Morphogenesis and Developmental Biology; Theories of Preformation and Epigenesis - Historical Review.

Unit 1: Gametogenesis; Ultra Structure and Differentiation of Sperm and Ova; Vitellinogenesis and its control; Fertilization; Parthenogenesis.

Unit 2: Types of eggs and Patterns of Cleavage; Biochemical changes and significance of Cleavage; Fate maps; Morphogenetic movements; Gastrulation and formation of germ layers; Significance of gastrulation.

Unit 3: Germ layers and their fate; Implantation and Development of Placenta in Mammals. Organogenesis of Brain, Eye and Heart.

Unit 4: Metamorphosis in Amphibians and Insects and Its control; Principles of Regeneration.

Unit 5: Organizer and Its Role in Development; Nucleocytoplasmic Interactions - Nuclear cloning and pluripotency of differentiated cells; Concepts of Differentiation.

Z-106 CONCEPTS OF ANIMAL DEVELOPMENT (Practical)

1. Induced breeding and development of frog
2. Study of life history stages of frog and chick
3. Hormonal control of amphibian metamorphosis
4. Incubation and mounting of chick embryo
5. In ovo study of chick development
6. Regeneration of Hydra
7. Regeneration of Planaria
8. Study of slides of development of frog
9. Study of slides of development of chick

Suggested Readings :

1. Balinsky, B.I. (1976) Introduction to embryology
2. Berril, N.J & Karp, G. (1978) Development
3. Berril, N.J. (1974) Developmental Biology
4. Grant, (1978) Biology of developing systems
5. Gilchrist, F.G. (1968) A Survey of embryology
6. Hamburger (1969) Mammal of Experimental Embryology
7. Rugh, (1950) The Frog, its reproduction and development
8. Oppenheimer (1984) Development
9. New DAT (1970) A culture of vertebrate embryos.

## Z-201 - Basic Biological Chemistry (Theory)

- Unit 1 Definition, history and scope of Biological Chemistry ; pH and buffer; Chemical bonds; Laws of thermodynamics; free energy in biological system; structure and conformation, classification and chemistry of carbohydrates, Amino acids, proteins, fatty acids and Lipids.
- Unit 2 Intermediary metabolism glycolysis; Krebs cycle; Oxidative phosphorylation; glycogenesis, gluconeogenesis, gluconeogenesis; HMP shunt, Reactions of amino acids; deamination; transamination, decarboxylation and oxidation, urea cycle.
- Unit 3 Oxidation of fatty acids, bio-synthesis and degradation of nucleotides. General accounts of biochemical pathways of photosynthesis and photorespiration. High energy compounds , energy changes.
- Unit 4 Enzymes, Energetics of enzyme catalysed reactions: active site; mechanism of enzyme action, enzyme activity- inductions and inhibitions. Factors affecting enzyme activity.
- Unit 5 Enzyme kinetics : Michaelis - Menten equation; determination and significance of  $K_m$ ; Isoenzymes; Allosteric enzymes; co-factors and co-enzymes.

## Z-202 Basic Biological Chemistry (practical)

1. Preparation of buffer.
2. Estimation of sugar using anthrone reagent.
3. Estimation of amino acids using Nynhydrin reagent.
4. Estimation of protein using Biuret reagent.
5. Estimation of protein using Folin reagent.
6. Separation and identification of sugars by proper chromatography.
7. Separation and identification of amino acids by paper chromatography.
8. Determination of pKa of aminoacids.
9. Estimation of cholesterol.
10. Effect of temperature on enzyme activity.
11. Effect of pH on enzyme activity.
12. Effect of time on enzyme activity.
13. Effect of (S) on enzyme activity.
14. Determination of  $K_m$  and  $V_{max}$  of enzyme by Michaelis-Menten and Lineweaver-Burk plots.
15. In vitro inhibition of an enzyme by a chemical inhibitor with M.M. & L.B. Plot.

Contd ...

16. Extraction and quantification of chlorophyll.
17. Separation of plant pigments by paper chromatography.
18. Basic principles of the functioning of colorimeter, spectrophotometer, pH meter and centrifuge.

Suggested Readings -

1. Lehninger, A.L. (1983) principles of Biochemistry.
2. Martin, D.W. et al. (1981) Harper's Review of Biochemistry
3. Conn and Stump (1976) Outlines of Biochemistry.
4. West et al. (1975) practical Biochemistry.

Contd..

Z-203 - Genetics and Evolution (Theory)

- Unit 1 Chromosomal aberrations; Structural and numerical changes; Unusual chromosomes; ring chromosomes, Isochromosomes, Supernumerary chromosomes, Chromosomes with unusual centromeric characteristics.
- Unit 2 Concept of gene, Recombination, mutation, lethal & sublethal genes.
- Unit 3 Extranuclear inheritance; plasmon concept; Hybridisation, heterosis, malesterility.
- Unit 4 preliminary ideas of the genetics of bacteria, virus plasmids, gene-action & regulation; preliminary ideas of genetic engineering, genetic counselling behavioural genetics.
- Unit 5 Synthetic theory of evolution; genetic drift; genetic equilibrium; gene duplication.

Z- 204 - Genetics and Evolution (practical)

1. preparation of Karyotypes.
2. Study of Chiasma frequency.
3. polytene chromosome mapping.
4. Giemsa banding of chromosomes.
5. Determination of blood-groups.
6. *Drosophila* genetics :
  - i) preparation of culture medium
  - ii) Study of mutants.
  - iii) Determination of sex ratio
  - (iv) Study of life cycle; handling of flies.
  - (v) Experimental crosses with autosomal and sex-linked mutants.

Suggested readings;

1. Schule & Schaeffer (1980) Cytogenetics.
2. Lewin, B(1980) Gene expression Vol. 1, II & III.
3. Rddel, S.P. 1982) Genetics.
4. Woodward & Woodward (1980) Molecular Genetics.
5. White M.J.D (1973) Animal Cytology & Evolution.
6. Korochkin, L.I. Gene action in Development.
7. Harkowitz, I.H. Principles of Genetics.
8. Chakraborty, A.M.(ed) Genetics Engineering.
9. Sharma & Sharma (1984) Advances in Chromosome & Cell Genetics.
10. Dodson, E.O.(1968) Evolution; process and product.
11. Ohno, S(1970) Evolution by Gene Duplication.

## BIOSTATISTICS AND HISTOLOGY (Theory)

### Part - I (Biology) (10 Marks)

1. Define species and give term and definition, important results. Classification of species of animals.
2. Define and explain taxonomic characters, taxonomic levels and ecological characters of animals.
3. The following stages in evolution: type of lineage change, mechanism of mutation and molecular evolution.
4. Give contrasting different concepts, difficulties in the application of biological characters for different kinds of characters.
5. Give names, collections and priority of identifying different kinds of taxonomic characters, characters and of classification. Animal Hierarchy.
6. Give names, characters of taxonomic levels.
7. Give names, characters of taxonomic characters, characters of nomenclature; brief description of the rules.

### Part - II (Statistics) (10 Marks)

1. Define importance and limitations of Statistics. Population and sample, Sampling methods, design of experiments, Collection and tabulation of Data, Diagrams: bar graphs, representation of data, Frequency distribution and measures of central tendency, measures of dispersion, skewness and kurtosis.
2. Define normal and distribution functions - some standard distribution functions: normal, binomial, Chi-square, Student's 't' and Spearman's 'r'.
3. Define regression, correlation, curve fitting and principle of least square, Association, test of independence and Chi-square test, large sample tests, Small sample tests, Sign test, etc.

## BIOSTATISTICS AND HISTOLOGY (Practical)

### Part - I (Biology) (10 Marks)

1. Distribution and classification of commonly available freshwater fishes of the region.
2. Study of any 2 freshwater micro-organisms (Protozoa and Amphipods) of Indian water bodies.

Unit 1 - Identification of common groups of insects: Tracheata, (Group of Earth-Beetles)

Unit 2 - Identification of taxon and status of local species of Frog and Toad.

Unit 3 - General survey and identification of well known birds.

Unit 4 - Preparation of taxonomic key for the identification of selected organisms.

Unit 5 - Visit to local regional station of Zoological Survey of India. Seeking to study the deposited collections related to the local fauna.

Unit 6 - collection and submission of local and commonly available animals (the students are required to make collection related to the different groups of organisms and submit a field report).

**Part - II Statistics (25 Marks)**

Unit 1 - To make line diagram, bar diagram, frequency table, column diagram, frequency polygon, Histogram, ogives etc. from a given data.

Unit 2 - Computation of averages, quartiles, mean deviation, standard deviation, coefficients of skewness and kurtosis.

Unit 3 - Computation of coefficients of correlation and regression and fitting straight line for a bivariate data.

Unit 4 - Student's 't' test, Chi square test and Fisher's 'F' test.

Unit 5 - Computation of ANOVA for one-way and simple two-way classified data.

**Suggested Readings:**

Mayr, E. (1960) Principles of Systematic Zoology.

Kapoor, V.C. (1984) Theory and Practice of Animal Taxonomy.

Ross, H.H. (1974) Biological Systematics.

Bishop, C.N. (1980) Statistics for Biology 3rd Ed.

Darker, R.D. Introductory Statistics for Biology, 2nd Ed.

Nair, N.T.J. (1963) Statistical Methods in Biology.

Campbell, R.C. (1977) Statistics for Biologists.

Steel, G.W. and Cochran, W.G. (1967) Statistical Methods 6th Ed.

Jaffery, C. (1980) Biological Nomenclature.

Smith, F.H.A. & Sokal, R.R. (1973) Numerical Taxonomy.

Hopwood, V.H. (Ed.) (1973) Taxonomy and Zoology (Systematic Association).

## Z-301 ANIMAL ECOLOGY (Theory)

Biological Land: Concept of Ecosystems (interdependent nature of plants and animals); Environmental factors: Medium, Substrate, Soil, Water, Temperature, light, Oxygen, Carbon dioxide, Salts, Acids; Laws of limiting factors; Experimental Ecology.

Unit 2: Basic features of Population Ecology: Natality, mortality, growth, survivorship, life tables, population interactions, competition, predation and relationship.

Unit 3: Community Ecology: Structure and composition; Diversity of ecosystems; terrestrial, freshwater and marine.

Unit 4: Dynamics of ecosystems: structure and ecosystem development, food-chains and food-webs; Lindeman's trophic pyramid concepts; energy flow and biogeochemical systems; Primary and secondary productivity; concepts and methods of measurements.

Unit 5: Man and his environment; environmental degradation and pollution - air, water and soil including radioactive wastes; animal resource management with reference to wild life of North-Eastern India.

## Z-302 ANIMAL ECOLOGY (Practical)

1: Soil moisture content, pH, organic content and conductance.

Unit 2: Response to environmental stress (Temperature) stress on housefly.

Unit 3: Dissolved oxygen, Carbon dioxide and alkalinity of water samples.

Unit 4: Temperature profile in soil layers and light penetration in aquatic systems.

Unit 5: Population density: Man in relation to abiotic factors in terrestrial/aquatic systems.

Unit 6: Simple population sampling, sampling of a known sample and mark - recapture method.

Unit 7: Population growth and succession in laboratory cultures of *Drosophila/Tribolium/Isopods/Protococcus*.

Unit 8: Morphological variation in a natural population of snails.

Unit 9: Intraspecific competition - effects of crowding on fecundity of *Drosophila* and seedling growth of Sunflower seeds.

Unit 10: Species abundance and their distribution in any terrestrial habitat.

Unit 11: Primary productivity measurements in aquatic systems using light and Dark bottle method or Chlorophyll method.

Unit 12: Study of food web structure and pyramids of numbers.

Unit 13: Estimation of water pollution index (W.P.I.) by algal population.

Unit 14: Pesticide residue estimation.

Unit 15: Effect of organochlorines on soil fauna.

Unit 16: Demographic studies using Census Data.

## Suggested Readings :

1. Franko, R.G. & Franks, D.N. (1975) Man and the Changing Environment.
2. Kormondy, L.J. (1978) Concepts of Ecology.
3. Kendeigh, C.S. (1975) Ecology with special reference to animals and man.
4. Odum, E.F. (1983) Basic Ecology.
5. Whittaker, R.H. (1975) Communities and Ecosystem.
6. Margalef, R. (1968) Perspectives in Ecological Theory
7. Elton, C. (1966) The pattern of Animal Communities.
8. Siesel, J.T. (1974) The Biology and Adaptability of Natural Population.
9. Kucera, L.C. (1973) The Challenge of Ecology.
10. Anderwartha, H.G. (1961) Introduction to the Study of animal populations



5. Study of the helminth parasites of economic importance from permanent preparations.
6. Study of larval trematodes from snail hosts.
7. Isolation and preparation of plant parasitic nematodes.

Suggested Readings:

1. Chatterjee, K.D. (1980) Parasitology; Protozoology and Helminthology in relation to clinical medicine (12th Edition).
2. Cheng, T.C. (1973) General Parasitology.
3. Cox, F.E.G. (1982) Modern Parasitology.
4. Faust, E.C.; Beaver, F.C. and Jung, R.C. (1975) Animal agents and vectors of human diseases (4th edition).
5. Noble, E.R. & Noble, G.A. (1982) Parasitology, The Biology of animal parasites (5th Edition).
6. Soulsby, E.J.L. (1982) Helminths, Arthropods and Protozoa of domesticated animals (7th edition).
7. Chandler, A.C. & Read, C.Ø. (1961) Introduction to Parasitology (10th Edition).

## Z-305 SPECIAL PAPERS - I (Theory)

(A) LIMNOLOGY

- Unit 1: Historical background, definitions and scope.  
Current Status of Limnology in India and its future approach.  
Classifications of inland waters-lentic and lotic systems.
- Unit 2: Lakes - their origin, distribution; geomorphology of lake basins.  
Water as an environment-physical conditions, hydrological cycle, global water balance; Water movements-hydrodynamics of water movement, waves, eddy diffusion, surface waves, internal water movements.
- Unit 3: Physical conditions:  
Light- distribution of light penetration, transmission- and light absorption; factors effecting light penetration.  
Temperature-distribution of heat, thermal stratification- types of stratification.
- Unit 4: Oxygen-solubility of oxygen in freshwaters, oxygen deficits.  
Distribution of major ions in freshwaters-Calcium, Magnesium, Sodium, Potassium and other cations. Chloride and other anions.  
Alkalinity of natural waters-Carbonate systems, Hydrogen ion activity, distribution of inorganic carbon and pH.
- Unit 5: Biogeochemical cycling of major nutrients in freshwater- Phosphorus and Nitrogen Cycles.  
Biogeochemical cycling of essential micronutrients-Iron, Sulphur and Silica cycles.

## Z-306 SPECIAL PAPER -I(Practical)

(A) LIMNOLOGY

1. Measurements of pH and Conductivity of various water bodies in and around Shillong.
2. Estimation of dissolved oxygen in selected water-bodies.
3. Estimation of total alkalinity and free carbon dioxide in selected water bodies.
4. Analysis of total hardness, Calcium and Magnesium and Chlorides in selected water bodies.
5. Analysis of Sulphate in the provided water samples.
6. Comparison of phosphate content of the selected water bodies.
7. Comparison of Nitrate and Silicate concentrations in the selected water bodies.
8. Survey of phytoplankton of Shillong and its adjacent areas.
9. Survey of Zooplankton of Shillong and its adjoining areas.
10. Quantitative estimation of phyto-and zooplankton abundance in selected water bodies.

## Suggested Readings

(Please see under 406-Limnology-II)

## 2-105 SPECIAL PAPER - I (Theory)

### (B) BIOCHEMISTRY AND ADAPTATION

- Unit 1:** Chemical evolution and molecular organization of living structures; properties of water as a suitable medium for living systems; history and physico-chemical properties of nucleic acids; structural and functional variations in the prokaryotic and eukaryotic genome-DNA and RNA; sequence determination of nucleic acids; DNA polymerase and RNA polymerase in prokaryotes and eukaryotes. Restriction enzymes.
- Unit 2:** Organization and regulation of expression of genes in prokaryotes and eukaryotes; overlapping genes and cell genes; Genetic engineering; Recombination and cloning of genes; In vitro and chemical synthesis of nucleic acids and proteins.
- Unit 3:** Protein synthesis; Translational and post-translational modifications; significance and determination of primary, secondary, tertiary and quaternary structure; of proteins; structural variations and functions of chromosomal proteins; antibodies; diversity; Monoclonal antibodies; interferon; Receptors.
- Unit 4:** Enzymes - Classification; Determination of active sites; mechanism of enzyme-catalysed enzyme activity and regulation-inhibition and allosteric effectors; Kinetics of single and bi-substrate reactions; problems based on rate of reactions; determination of Km & Kt; Coenzymes structure and functions (CoA, NAD, NADP, FAD; FMN, TPP, PP).
- Unit 5:** Fractionated techniques: Homogenization; Centrifugation; preparative and analytical Ultracentrifugation; selective precipitation; salting out, Isoelectric pH and organic solvents; chromatography: partition, adsorption, ion-exchange, gel filtration, and affinity; Electrophoresis: isoelectric focusing; Spectrophotometry; Dialysis and ultrafiltration, freeze drying; kinetic study of radio-isotopes and measuring radio activity.

## 2-106 SPECIAL PAPER - I (Practical)

### (B) BIOCHEMISTRY AND ADAPTATION

- 1-10: Separation, purification and estimation of different biomolecules (DNA, RNA, protein, amino acid, sugars, lipids, free and bound phosphate) from animal tissue.
- 11-18: Qualitative analysis of different groups of biomolecules (nucleic acids, nucleotides, proteins, amino acids, sugars and lipids) by using chromatographic, electrophoretic and spectrophotometric techniques.

#### Suggested Readings

1. Rainey, J.D. (1983) Biochemistry.
2. Stryer, L. (1983) Biochemistry (2nd Edn.)
3. Lehninger, A.L. (1983) Principles of Biochemistry.
4. Lewis, B. (1983) Genes.
5. Watson J.D. (1980) Molecular Biology of the Gene.
6. Chervil, J.D. (1980) The Gene and the Genetic Code.
7. Segel: Biochemical Calculations.

**Z-305 SPECIAL PAPER -I (Theory)****(C) CYTOGENETICS**

- Unit 1: Evolution of the Meiotic mechanism: Mutational Changes: meiotic drive, achiasmatic meiosis.
- Unit 2: Somatic cell Genetics: Somatic Cell lines, mutations and epigenetic variation, mutation rate.
- Unit 3: Hybrid cells (Cell Fusion): Nucleocytoplasmic interactions, transplantation of nuclei, fusion of somatic cells, cytoplasts and karyoplasts.
- Unit 4: Special techniques: Cell culture, Autoradiography, Fluorescence microscopy.
- Unit 5: Biochemical Genetics-Preliminary ideas about allozyme analysis, Electrophoresis.

**Z-306 SPECIAL PAPER -I (Practical)****(C) CYTOGENETICS**

1. Preparation of Invertebrate chromosomes.
2. Preparation of Vertebrate chromosomes.
3. Metrical studies of chromosomes.
4. Study of chromosomes morphology during cell division.
5. Longitudinal differentiation of chromosomes:
  - (i) G-banding
  - (ii) C-banding.

**Suggested Readings**

1. M.J.White (1973) Animal Cytology and Evolution.
2. Benjamin Lewin (1980) Gene Expression Volumes I, II, III.
3. N.C.Biachi (1983) Chromosome Organization and Cytogenetics.
4. Harris (1974) Cell fusion.
5. C.J.Bertick & A.T.Sunner (1980) The Eukaryotic Chromosomes.
6. Sharna & Sharna (ed) (1984) Advances in Chromosomes & Cell Genetics.
7. Chopra, Joshi, Sharna & Bansal (ed) (1984) Genetics: New Frontiers, Vol.I

## Z-305 SPECIAL PAPER -I (Theory)

(D) DEVELOPMENTAL BIOLOGY

- Unit 1: Structure and assembly of cells and tissues; Cyto-differentiation; Molecular Biology of Early Development.
- Unit 2: Early development of sea urchin & double gradient hypothesis; Origin and formation Primary organ rudiments in vertebrates.
- Unit 3: Limb and somite morphogenesis; Morphogenesis of eye and retinal architecture, Retino-tectal relationship and ontogeny of lens crystallins.
- Unit 4: Development of immune system; Benign and malignant tumors and Malignancy.
- Unit 5: Cell death and Morphogenesis; Growth; Ageing; Genes and Chromosomes in development.

## Z-306 SPECIAL PAPER -I(Practical)

(D) DEVELOPMENTAL BIOLOGY

- 1-4 Preparation of Microtomy slides of frog and chick development.
- 5-6 Preparation of dyed agar and study of morphogenetic movements.
- 7-11 Analytical experiments on frog (such as effect of pressure on cleavage, parabiosis, explanation, organiser and exogastrulation) and chick (such as explanation, induction and cell dissociation) embryos.
- 12-13 Alizarin preparation of developing stages of frog and chick.
14. Study of insect development.
15. Study of imaginal discs in Drosophila.

## Suggested Readings:

(Please see under Developmental Biology II)

## Z-305 SPECIAL PAPER -I (Theory)

(E) Entomology

- Unit 1: Introduction to Entomology and its major branches; classification, origin and evolution of insects.
- Unit 2: Insect segmentation and cephalization; external morphology of a generalized insect; modification mouthparts, wings, legs and genitalia.
- Unit 3: Functional Morphology on Integument, digestion, excretion, circulation, respiration, reproduction, and nervous system.
- Unit 4: Sense Organs-mechanical and chemoreceptors, sound and light producing organs and their evolutionary significance; Neuroendocrine system-structure, function and metabolism, endocrine control of growth and metamorphosis, reproduction, diapause, osmoregulation, pheromones and defense mechanism.
- Unit 5: Special mode of reproduction, embryonic development, pharmacology of insects.

## Z-306 SPECIAL PAPER -I (Practical)

(E) ENTOMOLOGY

- 1-4 Collection preservation and display of insects with emphasis on insects of agriculture, horticulture and medical importance.
5. Study of Morphology of Grasshopper.
- 6-9 Study and permanent mount preparations of different types of antennae mouth parts, legs and wings.
- 10-13. (a) General anatomy of nervous system of grasshopper, bug, housefly, honeybee, larval stages of insects.  
(b) Neuroendocrine system of insects.  
(c) Reproductive system of insects.  
(d) Silk gland of insects.  
(e), Poison apparatus of insects (honey bees).
14. Study of pollinating insects and their modifications.
15. Analysis of pH of various regions of gut.
16. Analysis of venom of bees, ants/wasps.

## Suggested Readings:

1. A.D.Inms (1970). A General Textbook of Entomology.
2. V.B.Wigglesworth (1973). The principles of Insect physiology.

3. W.S. Romoser (1973) The Science of Entomology.
4. R.F. Chapman (1973). Insects, Structure and Function;
5. E. Sondheimer and H.B. Simeone (1970) Chemical Ecology.
6. D. Gilmour (1967). The physiology of Reproduction-  
University Reviews in Biology.
7. P. Englemann (1970) The Physiology of Reproduction.
8. M. Jacobson (1972). Insect Sex pheromones.
9. T. Eisner and E.O. Wilson (1977). The Insects. Sci. Amer.

## Z-305 SPECIAL PAPER -I (Theory)

(F) PARASITIC HELMINTHOLOGY

- Unit 1: Detailed classification of Trematoda, Cestoda, Nematoda, Acanthocephala upto Order/Super Family level.
- Unit 2: Structure, composition and functions of helminth body surfaces.
- Unit 3: Integumentary or cuticular specialisations; Adhesive and anchoring apparatus in Trematoda and Cestoda.
- Unit 4: Musculature and pseudocoelom in Nematoda. Alimentary Canal in Trematoda and Nematoda.
- Unit 5: Excretory organs and system, sense organs and nervous system, reproductive system in helminths.

## Z-406 SPECIAL PAPER -I (Practical)

(F) PARASITIC HELMINTHOLOGY

Morphological studies of the types representing different groups- structural variations; Histology of the trematode, cestode, nematode and acanthocephalan parasites.

## Suggested Reading

Please see under Parasitic Helminthology-II

## Z-401 ENDOCRINOLOGY AND HISTOCHEMISTRY (Theory)

Distribution and scope of Endocrinology: General survey of endocrine glands of vertebrates: Synthesis, secretion and transport of hormones: Control of the endocrine glands: Assay of hormones: Mechanism of action of hormones.

Survey of neuroendocrine systems in vertebrates with special emphasis on insects and crustaceans: Hormonal control of growth, metamorphosis and reproduction in insects: Pheromones.

Study of structure and function of the following endocrine glands in mammals: Pituitary, Hypothalamic-hypophyseal complex, thyroid, adrenal, testis, ovary, pancreas, parathyroid, thymus and placenta.

Life histories of the estrous and the menstrual cycles, hormones of pregnancy: Mechanism of fertility control, postnatal development, steroid hormones, gonadotrophins, gonadotrophin releasing hormone, prolactin, placental lactogen: Endocrine control of homeostasis: Energy metabolism, Calcium and phosphate metabolism.

Principles of function, preservation and staining: Principles of histochemical demonstration of carbohydrates, lipids, proteins and nucleic acids: General principles of enzyme histochemistry: Acid and alkaline phosphatases, succinic dehydrogenase.

## Z-402 ENDOCRINOLOGY AND HISTOCHEMISTRY (Practical)

Distribution of neuroendocrine system of vertebrates.

Study of effect of oestrogen on direct metamorphosis.

Survey of endocrine glands in the albino rat/mice.

Maintenance of a colony of albino rats/mice.

Study of the estrous cycle in albino rats/mice by taking vaginal smear.

Study of the effect of castration on the secondary sex organs of the male albino rats/mice.

Study of the effect of ovariectomy on the secondary sex organs of the female albino rats/mice.

Study of the effect of thyroidectomy (chemical/cauterized) on Hb, RBC & WBC in rats/mice.

Study of the effect of adrenalectomy on the glucose in liver and plasma of albino rats/mice.

Bioassay of testosterone.

Bioassay of oestradiol.

Histochemical study of carbohydrates & proteins.

Histochemical study of lipids.

14. *Histochemical study of nucleic acids.*
15. *Histochemical study of phosphatases.*
16. *Histochemical study of succinic dehydrogenase.*
17. *Histochemical study of catecholamines.*

**Suggested Readings:**

1. Turner and Bagnara; General Endocrinology, 6th edition.
2. Williams (1981) Text Book of Endocrinology.
3. Gorbmer et al (1983) Comparative Endocrinology.
4. Highnam and Hill (1977) The Comparative Endocrinology of the Invertebrates.
5. Pearse: Histochemistry: Theoretical and applied, Vol. 1 and 2.
6. Casselman: Histochemist techniques.
7. Microscopic Histochemistry: Principles and Practice.
8. Bentley (1976) Comparative vertebrate Endocrinology.
9. Moody (1981) Endocrine physiology.
10. Gorbman and Bern: A TextBook of Comparative, Endocrinology.
11. Goldsworthy et al (1981) Endocrinology.

### 2-403 FISH BIOLOGY (Theory)

The various aspects of fish biology in this course are with reference to teleosts only.

- Unit 1:** Basic fish anatomy and concepts of functional morphology of fish; integument, scales, colouration, form and locomotion; skeletal system.
- Unit 2:** Food, digestion and growth, feeding habits; respiratory respiratory organs, air bladder, constitution of blood and circulation.
- Unit 3:** Excretion and osmoregulation; sense organs and neuroendocrine system, reproductive system; storage and cycles of gonadal maturation.
- Unit 4:** Classification upto order of fishes, Freshwater and marine fish fauna of India; distribution of fishes, composite culture, induced breeding and seed collection techniques with special reference to India.
- Unit 5:** Parental care and spawning migrations; aestivation and overwintering; Functionalities of fish (Tilapia, Carp and ornamental fishes) genetics and hybridisation; impact of water pollution on fish population.

### 2-404 FISH BIOLOGY (Practical)

1. Classification upto Order and identification of fishes locally available.
2. Dissection of the following systems; alimentary system, urinogenital system, accessory respiratory organ, brain, air bladder and Weberian ostelets.
3. Histology of the following tissues; intestine, stomach, gills, liver and kidney.
4. Whole mounts of different kinds of scales.
5. Age determination with the help of scales.
6. Estimation of fecundity.
7. Gonadosomatic and gonadosomatic indices.
8. Structure of pituitary and induced breeding techniques in fish.
9. Food and feeding mechanism in fish.
10. Length-weight relationships in fish.
11. Hematology in fish.
12. Reproductive behaviour and courtship in fish.
13. Meristic count and morphometric measurements.
14. Calorific estimation of fish tissues.

**Suggested Readings :**

- Day, F. (1889) The fauna of British India, including Ceylon and Burma;  
Fishes Vols I and II.
- Jhingran, V.G. (1982) Fish and fisheries of India.
- Lowe-Mc Connell, R.H. (1975) Fish communities in tropical freshwaters-  
Their Distribution ecology and evolution.
- Nikolsky, G.V. (1969) The ecology of fishes.
- Jayaram, K.C. (1981) The freshwater Fishery of India - A Handbook; Z.S.I.  
Publications.
- Rounsefell, Everhart (1973) Methods of fishery Science.
- Lagler, K.F. (1978) Freshwater Fishery Biology.
- W.H. Hear & D.J. Randal ed. (1969) Fish Physiology.
- Ricker, W.E. (1973) Methods of assessment of fish production in freshwaters.
- Martyashvili, F.G. (1983) Pond Fisheries.
- Huet, M. (1972) Textbook of fish culture, breeding and cultivation of fish.
- Lagler, K.F., Bardach, J.E. & Miller, R.R. (1977) Ichthyology 2nd ed.

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Z- 409 SPECIAL PAPER-II (Theory)

(A) LIMNOLOGY

- Unit: 1:** Freshwater biocoenosis- composition, introduction to various groups of freshwater organisms. Salient features of dominant groups of planktonic and benthic organisms. Qualitative and quantitative sampling of biota of lentic and lotic habitats and ground-waters.
- Unit 2:** Running-water communities- nature and composition of the biota, ecological adaptations and drift. Standing water communities- biotic communities and their distribution, ecological adaptations. Ground-water communities- introduction to ground-water ecosystems, general features of ground-water biocoenosis, their distribution and ecology.
- Unit 3:** Ecology of waste-waters- characteristics of waste-waters, criteria for their utility. Waste-water stabilization ponds- general features and biological characteristics. Mechanical and biological treatment of waste-waters. Removal of Phosphorus and nitrogen and Disinfection. Process of sludge treatment and disposal.
- Unit 4:** Ecological succession -spatial distribution, horizontal distribution and vertical migration w.s.r. to bacteria and planktonic communities. Feeding by fish and size-selectivity. Cyclomorphosis- in dinoflagellates, Rotifera and Cladocera, its adaptive significance and reasons for cyclomorphosis. Eutrophication- its impact on biological communities - trophic indicators.
- Unit 5:** Food-chain dynamics- food-chains, trophic relationships ecological pyramids, the regulation of nutrients and energy flow.

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Estimation of biomass of freshwater organisms w.s.r. to Phytoplankton, Rotifers, Cladocerans and Copepods.

Primary productivity- different methods- dark and light bottle method, <sup>14</sup>C technique and chlorophyll extraction method.

Secondary productivity- different methods for calculation of secondary production in populations with and without cohorts.

Z- 406 SPECIAL PAPER-II (Practical)

(A) LIMNOLOGY

1. Comparison of species composition, abundance and dominance of planktonic communities in selected water bodies w.s.r. to littoral and limnetic species.
2. Effect of temperature on the embryonic durations of commonly available species of zooplankton.
3. Observations on the head shields and head pore arrangements of common species of cladocerans.
4. Survey and distribution of benthic organisms in a hill stream.
5. Estimation of primary productivity by dark and light bottle method.
6. A project with 50% weightage of the paper.  
(The project will be evaluated completely at the end semester examination and internal assessment 12.5 marks will be from the practicals).

Suggested Readings:

1. Wetzel, R.G. (1983) Limnology.
2. Goldman, C.R. (1983) Limnology.
3. Hynes, H.B.N. (1970) The Ecology of Running Waters.
4. Odum, E.P. (1971) Fundamentals of Ecology.
5. Danielopol, D. Introduction to Groundwater Ecology.
6. Reid, G.K. (1969) Ecology of Inland Waters and Estuaries.
7. Russell-Hunter, W.D. (1970) Aquatic Productivity.
8. Whitton, B.A. (1975) River Ecology.
9. Ruttner, F. (1975) Fundamentals of Limnology.
10. Beyer, J.E. (1976) Aquatic Ecosystems.
11. Volle nweider, R.A. (Ed.) (1974) A Manual on methods for measuring Primary Production in Aquatic Environments.
12. Edmondson, W.T. & Winberg, G.G. (eds.) (1971) A manual on methods for the assessment of Secondary Productivity in fresh waters.
13. Schwerbel, J. (1972) Methods of Hydrobiology (Freshwater Biology).

## 2-402 SPECIAL PAPER - II (Theory)

### (A) BIOCHEMISTRY AND ADAPTATION

**Unit 1:** Thermodynamics: Entropy and enthalpy; application of second law of thermodynamics to formation and release of energy; oxidation-reduction reactions; free energy and determination of free energy change in biochemical reactions; equilibrium constants in biological systems.

**Unit 2:** Metabolism of essential nutrients (Pro., H<sub>2</sub>O, Fatty Acids); Metabolism of nucleotides; Oxidative, substrate level and photophosphorylation; Metabolic regulation by hormones, G-ATP, inhibitors and feed-back regulation; Coupling of metabolic activity in the cell.

**Unit 3:** Nature, extent of stress and strain; concept of elastic and plastic strain; stress-strain; stress resistance, stress avoidance (regulation) and stress tolerance; responses to starvation, acclimation and acclimatization; concept of homeostasis; different types of environmental stress and their general effects-structural and rate effect.

**Unit 4:** Biochemical adaptation for cold and heat acclimation; biopolymers and homeostasis for homeostasis and for oxygen deficiency in animals; metabolism of drugs and chemical toxins; biological rhythms.

**Unit 5:** Regulation of amino acid metabolism (synthesis, utilization and excretion) in different animals and its significance; Biochemical changes during exercise and early developmental (fetal) and environmental (in) overexposure; metabolic control of ...

## 2-403 SPECIAL PAPER - III (Practical)

### (B) BIOCHEMISTRY AND ADAPTATION

1. Fractionation of cell constituents by homogenization and differential centrifugation; identification by using biochemical markers.

2. Isolation and partial purification of enzymes. Determination of  $K_m$ ,  $K_i$  and  $V_{max}$ .

3. A project with 50% weightage of the paper. This project will be evaluated completely at the end semester examination and internal assessment 2.5 marks will be from the practicals.

#### Suggested Readings:

1. Lehninger, A.L. (1975) Biochemistry.
2. Stryer, L. (1988) Biochemistry.
3. Stryer, L. (1988) Biochemistry.
4. Hoar, C.L. (1984) Comparative Animal Physiology.
5. Hoar, B.S. (1934) General and Comparative Physiology.

6. Hochachka, P.W. and Somero, G.N. (1973) Strategies in Biochemical Adaptations.
7. Precht, H. et al (1973) Temperature and Life.
8. Pickering, A.D. (ed. ) (1981) Stress and Fish.
9. Campbell, J.W. & Goldstein, L. (1972) Nitrogen metabolism & environment.
10. Grisolia, S. et al (ed.) (1976) The Urea Cycle.
11. Grant, P. (1978) Biology of Developing System.
12. Kanungo, M.S. (1980) Biochemistry of Aging.
13. Malacinski, G.M. (1984) Molecular Aspects of early development.
14. Brachet, J. (1974) Introduction to molecular embryology.

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**Z-403 SPECIAL PAPER - II (Theory)**

**(C) CYTOGENETICS**

- Unit 1: Organisation of the Genetic Apparatus: Chromatin comprising Nucleosome-structure and organisation in Chromatin, Active and Inactive Nucleosomes.
- Unit 2: Organisation of the Eucaryotic Genome: Genes and complementation groups, the C value paradox, essential and nonessential genes, Repetitive and nonrepetitive sequences of DNA, Chromosomal location of satellite DNA.
- Unit 3: The Replication Apparatus: Replicons - their organisation and regional patterns.
- Unit 4: Cancer - the misregulated cells.
- Unit 5: Molecular cloning of genes : General procedures.

**Z-406 SPECIAL PAPER - II (Practical)**

**(C) CYTOGENETICS**

1. Longitudinal differentiation of Chromosomes - Fluorescence banding.
2. Electrophoretic studies.
3. A project with 50% weightage of the paper. (The project will be evaluated completely at the end of semester examination and internal assessment 12.5 marks will be from the practical).

**Suggested Readings**

1. B. Lewin, (1980) Gene Expression Volumes I, II & III.
2. Woodward & Woodward (1980) Concept of Molecular Genetics.
3. A.M. Chakravarty (Ed.) (1980) Genetic Engineering.
4. T.C. Hsu (1979) Human and Mammalian Cytogenetics.
5. R. Rainer Mairer (1971) Disc Electrophoresis and related techniques.
6. Sharma & Sharma (ed.) (1984) Advances in Chromosome and Cell Genetics.
7. Chopra, Joshi, Sharma & Bansal (Ed.) (1986) Genetics New Frontiers Volume-II.

**2-405 SPECIAL PAPER - II (Theory)**

**(D) DEVELOPMENTAL BIOLOGY**

- Unit 1:** Origin and Fate of Primordial germ cells Invertebrates and Vertebrates with special reference to Nematodes, Insects, Amphibia and Chick.
- Unit 2:** Organizer and Embryonic Induction: Morphological nature, dynamics, Molecular and Biochemical aspects; Neural Induction and Pattern Formation.
- Unit 3:** Early mammalian development: Fertilization, Cleavage, Implantation, Gastrulation, Formation of fetal membranes and various types of placentae; Test tube babies and pre-natal sex testing.
- Unit 4:** Cellular Slime molds: Morphogenesis and differentiation; Regeneration and Differentiation in Hydra. Effect of Environmental factors on development of Hydra; Regeneration of Amphibian Limb.
- Unit 5:** Morphology and differentiation of imaginal discs in Drosophila with emphasis on concepts of compartmentalization, positional information and transdetermination; Teratology; Developmental Biology in relation to Human Welfare.

**2-406 SPECIAL PAPER - II (Practical)**

**(D) DEVELOPMENTAL BIOLOGY**

- 1. Study of spirally cleaving eggs of *Mulhuca*.
- 2-3. Microtomy and study of developing eye of a vertebrate.
- 4. Experiments with cellular slime molds.
- 5. Transplantation of optic vesicle.
- 6. Study of primordial germ cells in histological slides.
- 7. Study of vaginal smears of mouse and collection of its developing stages.
- 8. A project with 30% weightage of the paper. (The project will be evaluated completely at the end semester examination and internal assessment 12.5 marks will be from the practicals).

**Suggested Readings:**

- 1. Browder, E. (1980) Developmental Biology.
- 2. Balinsky, B.I. (1976) Introduction to Embryology (8th Ed.).
- 3. Berrill, N.J. & Karp, G. (1978) Development.
- 4. Berrill, N.J. (1974) Developmental Biology.
- 5. Graham, C.F. (1976) Developmental Biology of Plants & Animals.
- 6. Grant, P. (1978) Biology of Developing systems.
- 7. Gilchrist, G. (1968) A Survey of Embryology.
- 8. Hamburger, V. (1968) Manual of experimental Embryology.
- 9. Bodemer, W. (1968) Modern Embryology.
- 10. Arey, L.B. (1965) Developmental anatomy. A textbook and laboratory, Manual of embryology (7th Ed.).

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## Z-405 SPECIAL PAPER - II (Theory)

### (F) ENTOMOLOGY

- Unit 1:** Introduction to Agriculturally and Horticulturally important insects, insect-plant relationships - different kinds of insect pests-pests of sugar cane, vegetable-crops, fibre crops, stored grains - their biology, life cycle and control; pest management.
- Unit 2:** Beneficial insects - apiculture, sericulture and bee industry - biology and ecology of beneficial insects and the control of their diseases; plant protection and extension entomology in line with particular reference to North-Eastern Region.
- Unit 3:** Concepts of Medical entomology, insects and vertebrates, insects, parasites and helminths; life cycle of medically important insects - bugs, lice, muscoid and siphonapterans, mites, fungi, disease transmission, venomous and stinging insects.
- Unit 4:** Concepts of population of insects; effects in relation to environment - biotic and physical factors; insects of soil and water; Entomobryozoa insects; elements of Forest Entomology.
- Unit 5:** Types of insect Pest control insecticides - formulation and application - mode of action. Principles of insect control cultural, biological, chemical and integrated control; physiology of insect resistance to insects.

## Z-406 SPECIAL PAPER - II (Practical)

### (F) ENTOMOLOGY

1. Study of major agricultural and horticultural pests of North-Eastern Region.
2. Techniques of population and systematic application of insecticides.
3. Study of multiparts of agricultural and horticultural pests.
4. Toxicological experiments.
5. Study of beneficial insects and their products.
6. Ecological experiments - effects of insecticides on growth and survival of any available insect (Cockroach or silkworm or Tribolium).
7. Pollinating insects - their morphological adaptations.
8. A project with 50% weightage of the paper. (The project will be evaluated completely at the end semester examination and internal assessment 12.5 marks will be from the practical).

#### Suggested Readings:

1. J.R. Corbett (1974) The biochemical mode of action of insecticides.
2. H.N. LeRoy (1971) Indian insect Pests.

1. K. Slansky, Romanuk, K. and Quinn, F. (1974) Insect Hormones.
2. D. Gilmore (1961) The biochemistry of insects.
3. W.S. Rungger (1973) The Science of Entomology.
4. G. Kerkut & L. E. Gilbert (1979) Comprehensive insect Physiology, Biochemistry and Pharmacology.
5. T.V. Ramakrishna Ayyar (1984) Handbook of Economic Entomology for South India.

**2-003 SPECIAL PAPER - II (Theory)**

**(F) PARASITIC HELMINTHOLOGY**

**Unit 10.2: Types and Biology of the egg and larval forms in helminth parasites.**

**Unit 2:** Parasite transmission and host finding mechanisms; Establishment and growth of parasites - hatching & excretion mechanisms

**Unit 4:** Establishment, site selection, factors affecting growth and development.

**Unit 8:** Variation in life cycles, infectivity and its effects on host; Immunity mechanisms against parasitic helminths.

**2-006 SPECIAL PAPER - II (Practical)**

**(F) PARASITIC HELMINTHOLOGY**

1. Faecal examinations and egg counts (direct smears, Stoll's method, Flotation methods) assessment of worm burden.
2. Use of Baermann apparatus for recovery of active larvae from faeces/faecal cultures or tissues.
3. Effect of temperature and salt concentration on the hatching of helminth eggs.
4. Culture of miracidia from fluke eggs.
5. Examination and identification of the 3rd stage larvae of nematodes.
6. Miscellaneous culture methods for experimental purposes, e.g., infective eggs of *Acanthocephalus*, infective stages of *Heterakis gallinarum*.
7. A project with 50% weightage of the paper. (The project will be evaluated completely at the end semester examination and internal assessment 12.5 marks will be from the practicals.)

**Suggested Readings**

1. Barret, J. (1980) Biochemistry of Parasitic Helminths.
2. Barriga, O.O. (1981) The Immunology of Parasitic Helminths.
3. Chappel, L.N. (1979) Physiology of Parasites.
4. Chitwood, B.G. and Chitwood, M.B. (1974) - Introduction of Nematology.
5. Cox, F.E.G. (1982) Modern Parasitology.
6. Crompton, D.W.T. (1976) An ecological approach to Acanthocephalan Parasites.
7. Daves, Ben (1968) The Trematoda.
8. Erasmus, D.A. (1972) Biology of Trematodes.

- Maggenti, A.R. (1951) General Nematology.
10. Huxley, L.H. (1951) The Invertebrates, Vols. II & III.
  11. Lee, D.L. and Atkinson (1975) The Physiology of Nematodes.
  12. Advances in Parasitology Volumes 1 to 21.
  13. Van Brand, T. (1979) Biochemistry and Physiology of endoparasites.
  14. Wardle, B.A., McLeod, J.A. & Radford (1976) Advances in the Zoology of tape worms (1950-70).
  15. Garcia, L.S. & Ash, L.A. (1979) Diagnostic Parasitology, Clinical Laboratory Manual.
  16. Manual of Veterinary parasitology, Laboratory techniques - H.M.S.O. Tech. Bulletin No. 18 (1972) (4th Edn).