Syllabus For

Advanced Post Graduate Diploma in Medicinal Plants (PGDMP)

EFFECTIVE FROM 2005-2006

SHRI BAPALAL VAIDYA BOTANICAL RESEARCH CENTRE
DEPARTMENT OF BIOSCIENCES
VEER NARMAD SOUTH GUJARAT UNIVERSITY
SURAT, GUJARAT – 395 007

VEER NARMAD SOUTH GUJARAT UNIVERSITY,

Advanced Post Graduate Diploma in Medicinal Plants

(APGDMP)

Semester –I

DMP 101 – Elements of Herbology

DMP 102 – Ethnomedicinal studies & medicinal plants

DMP 103 – Raw material Resources & Collection, Primary health care and herbs

DMP 104 – Phytochemistry & Pharmacological screening of herbal drugs

DMP 105 – Practical course on Identification of Medicinal Plants
Practical course on Processing and value addition
Practical course on Phytochemistry

Semester – II

DMP 201 – Herbal raw material Processing and their Products

DMP 202 – Quality control and Phytochemical methods

DMP 203 – Project Work

DMP 204 – Practical course on Herbal classical Drug Preparation
Practical course on Quality Control

Preamble

Humanity has developed intimate relationship with plant and plant products for human sustenance. Treating the ill using herbal resources is one of such activities. India has a rich heritage of traditional herbal knowledge as well as rich herbal diversity.

The study and research in these areas need trained personnel, who are good at plant taxonomy, field work and the applied aspects of Botany, especially medicinal plants.

Country is also witnessing a burgeoning demand and production of herbal Pharmaceuticals, Nutraceuticals and Cosmaceuticals. There is a global demand of such but authentic products. Pharma companies are in need of trained personnel at their quality control department.

This course envisages to train the students so as to develop the following.

a. Capacity building for identification of angiosperms
b. Commitment for medicinal plant diversity conservation
c. Ability to collect, process and store herbal raw material
d. Ability to handle quality control procedures and instruments for herbal drugs
e. Ability to undertake primary health care extensions for the rural populace.

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Elements of Herbology (DMP 101)

I. History and development of herbal science in India and abroad
- Sushrut
- Theophrastus (370 – 285 BC)
- Parashar (250 – 120 BC)
- Charak (1 AD)
- Dioscorides (1 AD)

II. Introduction to the literature on medicinal plants

Classics:
- Charak
- Rajnighantu
- Bhavprakash Nighantu
- Sharangdhar Samhita
- Nighantu Adarsh : Bapalal Vaidya
- Indian Medicinal Plants : Kirtikar and Basu
- Dictionary of economic products: Watt

Contemporary literature:
- Wealth of India
- Compendium of Indian medicinal plants
- Ethnovet Heritage: (Anjaria, Parabia, Dwivedi,)
- Napralert (Website)

III. Methods of identification:

Plant Morphology: Study of
- Root
- Stem
- Leaves
- Inflorescence
- Flowers
- Fruits and seeds

IV. Use of the flora in the identification of fresh plants

V. Field visit to the area as decided by the teacher

Method of sample collection, Herbarium specimen preparation, preservation. Purpose and importance of herbaria.

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Ethnomedicinal Studies & Medicinal Plants (DMP 102)

I. Protocol for carrying out ethnomedicinal studies
II. Medicinal plants of Gujarat

Identification, distribution and importance of following medicinal plants is expected.

Azadirachta indica
Abrus precatorius
Acacia catechu
Acacia concina
Acacia nilotica
Acacia polyacantha
Adansonia digitata
Adhatoda vasica
Adenanthera zeylanica
Adenenthera pavonina
Aegle marmelos
Aloe vera
Alstonia scholaris
Andrographis paniculata
Argyreia speciosa
Asparagus adscendens
Asparagus gonoclados
Asparagus racemosus
Bacopa monieri
Basella rubra
Boerhavia diffusa
Bombax malabarica
Bryophyllum calycina
Butea monosperma
Calotropis procera
Calotropis gigantea
Cannabis sativa
Cassia angustifolia
Ceiba pentandra
Centella asiatica
Chlorophytum borivilianum
Chlorophytum tuberosum
Cissus quadrangularis
Clerodendrum inerme
Clerodendrum multiflorum
Clerodendrum serratum
Commiphora wightiana
Costus speciosus
Crateva nurvala
Cymbopogon citratus
Desmodium gangeticum
Emblica officinale
Enicostema axillare
Erythrina indica
Euphorbia hirta
Ficus benghalensis
Ficus glomerata
Ficus religiosa
Ficus virens
Gmelina arborea
Gymnema sylvestre
Kalanchoe pinnata
Lawsonia inerme
Limonia acidissima
Mimosa pudica
Mimusops elengi

Oroxylum indicum
Oxalis corniculata
Papaver somniferum
Pedalium murex
Phyllanthus fraternus
Piper betel
Piper longum
Piper nigrum
Plumbago zeylanica
Premna integrifolia
Psydium guajava
Pterocarpus marsupium
Rauvolfia serpentina
Rauvolfia tetraphylla
Ricinus communis
Saccharum officinarum
Saccharum spontaneum
Salvadora oleioides
Salvadora persica
Santalum album
Sapindus laurifolius
Saraca asoca
Semecarpus anacardium
Sesbania grandiflora
Smilax zeylanica
Solanum indicum
Solanum xanthocarpum
Sterculia urens
Terminalia arjuna
Terminalia bellirica
Terminalia chebula
Thespesia populnea
Tinospora cordifolia
Tribulus terrestris
Tylophora indica
Uraria picta
Veteveria zizanioides
Vigna radiate var. sublobata
Vitex negundo
Withania somnifera
Zizyphus glabrata
Zizyphus nummularia

III. Nutritional Potential of Conventional and unconventional food material of Gujarat

- *Madhuca indica*
- *Morinda citrifolia*
- *Garuga pinnata*
- *Diospiros melanoxylon*
- *Eugenia jambolana*
- *Eleusine coracana*
- *Hordeum vulgare*
- *Vigna angularis*
- *Pithecellobium aman*
- *Pithecellobium dulce*

IV. Plants of cosmaceutical importance

- *Aloe vera*
- *Santalum album*
- *Hemidesmus indicus*
- *Sapindus laurifolius*
- *Acacia concina*

V. Ambiguity & Controversy on the identity of some classical drugs

- Som
- Astavarga
- Rasna
- Pashan bhed

VI. Conservation of medicinal plants

1. Non destructive and sustainable exploitation
2. Cultivation of medicinal plants
   - *Withania somnifera*
   - *Chlorophytum tuberosum*
   - *Andrographis paniculata*
   - *Cassia angustifolia*
   - *Justicia adhatoda*
   - *Cissus quadrangularis*
   - *Costus speciosus*
3. Micropropagation of medicinal plants
   - Methods
   - Development of tissue culture protocol for medicinal plants
   - Possible methods of improving yield
     - Selection of strains
     - Biotechnological methods (GM etc.)
4. Vegaries of market forces and importance of co-operative movement

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Raw material Resources & Collection , Primary health care and herbs (DMP 103)

I. Method and time of collection

II. Processing and value addition methods

- Underground parts : Roots, tubers
- Bark
- Leaves
- Flowers
- Seed & Fruits
- Exudates & gums
- Wood & wood extracts

III. Examples to be studied as under

Undergroundparts: roots, tubers, suckers

- *Asparagus racemosus*
- *Asparagus adscendens*
- *Chlorophytum tuberosum*
- *Chlorophytum borivilianum*
- *Dashmool (Ideal vs. Reality)*
- *Shemal musli: bombax malabarica*
- *Boerhavia diffusa*
- *Tephrosia purpurea*
- *Withania somnifera*

Bark:

- *Terminalia arjuna*
- *Tecomella undulata*
- *Moringa oleifera*

Leaves:

- *Justicia adhatoda*
- *Centella asiatica*
- *Ocimum sanctum*
- *Vitex negundo*
- *Cassia angustifolia*
- *Abrus precatorius*

Flowers:

- *Madhuca indica*
- *Careya arborea*
- *Hibiscus rosasinensis*

Seeds & fruits:

- *Emblica officinale*
- *Embelia tsjerum cottam*
- *Semecarpus anacardium*
- *Terminalia chebula*
- *Terminalia bellirica*
- *Gmelina arborea*
- *Cassia tora*
- *Cassia sophera*

Exudates & Gums:

- *Sterculia urens*
- *Acacia nilotica*
- *Anogeissus latifolia*
- *Bombax malabarica*
- *Commiphora wightiana*
- *Boswellia serrata*

Wood & wood extract:

- *Santalum album*
- *Adenanthera pavonina*
- *Pterocarpus marsupium*
- *Acacia catechu*

Panchang:

- *Eclipta alba*
- *Phyllanthus fraternus*
- *Andrographis paniculata*

IV. Primary health care with reference to digestive system, dermal system, and skeletal system

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Phytochemistry & Pharmacological screening of herbal drugs (DMP 104)

Phytochemistry:

I. Carbohydrates: mono and disaccharides, sugar alcohols, sugar acids, sugar amines. Polysaccharides: dextrins, inulin, matrix polysaccharides, gums and mucilages
II. proteins : peptides, lectins,
III. Lipids, Volatile oils Fattyacids and fatty oils Sesquiterpenes, diterpenes, triterpenes and tetraterpenes
IV. Glycosides: anthraquinones, isothiocynates, Flavonols, Lactones phenols Saponins and cardiac glycosides
V. Alkaloids, indoles, isoquinolines, tropanes, pyridine and piperidine, steroidal alkaloids.
VI. Bitter principle
VII. Phenols and tannins
VIII. Antibiotics
IX. Phyto-inorganic chemistry

Pharmacological screening of herbal drugs:

I. Need for phyto-pharmacological evaluation
II. Evaluation of anti diabetic agents
III. Evaluation of anti microbial agents
IV. Evaluation of anti diarrheal agents

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Herbal raw material Processing and their Products (DMP 201)

Methods of herbal drug preparation (Bhaishajya Kalpana)

I. **Quath:**

- Dashmool
- Pathyadi
- Patoladi
- Mahamanjistadi
- Devdarvyadi

II**. Avaleha:**

- Kantakari
- Bilvadi
- Chyavan prash
- Unnabadi

III. **Asava and Arista:**

- Drakshasva
- Abhayarista
- Arnitarista
- Khadirarista
- Arjunasava
- Lohasav
- Chandanasav
- Vasarista

IV. **Syrups:**

- Amla syrup
- Balchaturbhadra syrup

V. **Goolkand:**

- Rose
- Silk cotton flowers

VI. **Churna:**

Panchkol
Vasadi
Pushyanug
Sitopaladi
Triphala
Trikatu
Lavan Bhaskar
Hingvastak

VII. **Ghan:**

Guduchighan
Yashtimadhughan
Udumbar patraghan
Mamejak ghan

VIII. **Vat**i (tablets, pills)

Khadiradivati
Yashtimadhuvati
Karpur-hingool vati
Lashunadi vati
Kanyalohadi

IX. **Liniments:**

Jatyadi taila
Bhringraj taila
Bala taila

X. **Kshar:**

Apamarg kshar
Kadali stambha kshar

XI. **Bhasma:**

Ashwatha patra bhasma (Ficus regiosa leaves)
Kafkartari bhasma (Achyranthes aspera)

XII. **Ointments:**

Gandhak malam
Ral malam
Sindooradi

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Quality control and Phytochemical methods (DMP 202)

Phormocognosy:

I. Morphological examination

II. Microscopical evaluation

III. Development of Standardization parameters
   b. Solvent extractive values
   c. Ash values
   d. Crude fiber
   e. Moisture content
   f. Microbial infestation
   g. Bitter value
   h. Foaming index
   i. Swelling index
   j. Heavy metals
   k. Contaminations & Aflatoxins

IV. Adulteration and deterioration

Quality Control

V. Quality Assurance and stability testing

   a. GMP
   b. Physical quality assurance
   c. Stabilization
   d. Validation
   e. Marker compound evaluation

VI. Methods of isolation
   a. Solvent extraction
   b. Thin layer chromatography
   c. HPTLC

d. Column Chromatography
e. HPLC

VII. Methods of characterization
   a. Spectroscopic methods
      i. UV
      ii. Visible
      iii. IR
      iv. NMR
   b. Mass Spectrometry
   c. Atomic absorption
   d. GC-MS
   e. LC-MS

VIII. Intellectual property rights and Patent laws

SUGGESTED READINGS

Agnivesh (1968): **Charak Samhita (Volume I-II)** (2nd Edn.). Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Ambasta S. P. (1986): **The Useful Plants of India.** Publication & Directorate, CSIR, New Delhi.

Anjaria J., Parabia M.H. and Dwivedi S. (2002): **Ethnovet Heritage-Indian EthnoVeterinary Medicine: An Overview**. Pathik Enterprise, Ahmedabad.

Anonymous (1998): Quality Control Methods for Medicinal Plants Materials (Authorized Reprint). World Health Organization, Geneva.

Anonymous (1999): **Indian Herbal Pharmacopoeia (Volume I – II).** Joint Publication of Regional Research Laboratory (CSIR), Jammu and Indian Drug Manufacturers' Association.

Anonymous (2002): **WHO Monographs on selected Medicinal Plants (Volume I-II)**. World Health Organization, Geneva

Bahl A. and Bahl B.S. (2001): **Textbook of Organic Chemistry** (16th Edn.). S. Chand & Company Ltd., New Delhi.

Behramji D. J. (1952): **Aushadhakar- Ayurveda Ane Unani Vaidya Vidya no Mahagranth** (1st Edn.). Gandiv Sahitya Mandir, Surat.

Bobitt J.M., Schwarting A.E. and Gritta R.J. (1968): **Introduction to Chromatography**. Van Nostrand Reinhold Company, NewYork.

Bolliger H.R., Brenner M., Ganshirt H., Mangold H.K., Seiler H., Stahl E. and Waldi D. (1965): **Thin Layer Chromatography – A Laboratory Handbook**. Springer-Verlag Academic Press Inc. NewYork, London

Cappuccine J.G. and Sherman N. (2004): **Microbiology – A Laboratory Manual** (2nd Ind. Reprint). Pearson Education (Singapore) Pte. Ltd.

Chatwal G.R. (2001): **Synthetic Organic Chemistry** (3rd Edn.) (Reprint). Himalaya Publishing House, New Delhi.

Chauhan M. (): Microscopic profile of powdered drug used in Indian System of Medicine (Volume I).

Chopra R.N., Nayar S.L. and Chopra I.C. (1969): **Glossary of Indian Medicinal Plants**. Publication and Information Directorate, CSIR, New Delhi

Cracker L.E. and Simon J.E. (edt. by) (2002): **Herbs, Spices and Medicinal Plants : Recent Advances in Botany, Horticultuire and Pharmacology (Volume I-IV)** (Ind. Reprint). CBS Publishres & Distributors, New Delhi

DerMarderosian A. and Beutler J.A. (Co edt. by) (2002): **The Review of Natural Products (Volume I- II)** (2nd edn.). Facts and Comparisons, Missouri, USA.

Evans W.C. (2002): **Pharmacognosy (**15th Edn.). Saunders Publications.

Grieve M. (1982): **A Modern Herbal (Volume I-II**). Dover Publications, Inc. NewYork.

Handa S.S. and Kaul M.K. (edt. by) (1997): **Supplement to Cultivation and Utilization of Medicinal Plants**. Regional Research Laboratory, CSIR, Jammu-Tawi, J&K, India

Handa S.S. and Kaul M.K. (edt. by) (1997): **Supplement to Cultivation and Utilization of Aromatic Plants**. Regional Research Laboratory, CSIR, Jammu-Tawi, J&K, India

Harborne J. B. (1973): **Phytochemical Methods**. Chapman and Hall, London.

Jacobs M.B. (1999): **The Chemical Analysis of Food and Food Products** (3rd Edn.). CBS Publishers and Distributors, Daryaganj, New Delhi

Kirtikar K.R. and Basu B.D. (1998): **Indian Medicinal Plants (I to VIII Volumes)** (Text + Icons) (2nd edn.) (4th Reprint) BishenSingh Mahendrapal Singh, Dehradun

Kutumbiah P. (1969): **Ancient-Indian Medicine** (2nd Edn.) Sahgam Books Limited, London

Lindley J. (1993): **Encyclopaedia of Useful Plants of the World (Volumes I – IV)** (Reprint). Arihant Publishing House, Jaipur.

Mitra R. (1985): **Bibiliography on Pharmacognosy of Medicinal Plants**. Economic Botany Information Service, National Botanical Research Institute, Lucknow, India

Mukherjee P.K.(2002): **Quality Control of Herbal Drugs- An Approach to Evaluation of Botanicals** (1st Edn.). Business Horizons Pharmaceutical Publishers, New Delhi, India

Munshi V.D. (trans.) ( ) : **Astang Hridaya**. Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Parabia M.H. and Pathak S.S. (2002): **Apni Vanushadhi**. Manav Vikas Sansthan,Piplod, Surat.

Parikh R.J. (Trans.) (1975): Madhav Nidan (3rd Edn.).Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Parikh R.J. (Trans.) (1981): **Sharangdhar Samhita** (4th Edn.). Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Ragunathan K. and Mitra R. (comp. & edt. by) (1999): **Pharmacognosy of Indigenous Drugs (Volumes I – II)** (Reprint). Central Council for Research in Ayurveda and Siddha, New Delhi, India.

Raman N. (2005): **Phytochemical Techniques and Plant Tissue Culture**. Department of Botany, University of Madras, Chennai.

Rastogi R.P. and Mehrotra B.N. (1993): **Compendium of Indian Medicinal Plants (Volumes I – VI)**. CSIR, Lucknow and Publication & Information Directorate, New Delhi.

RaviKumar K. and Ved D.K. (2000): **100 Re-Listed Medicinal Plants for Conservation Concern in Southern India** (1st Edn.) Foundation for Revitalization of Local Health Traditions, Banglore.

Sadasivam S. and Manickam A (1996): **Biochemical Methods** (2nd. Edn.).New Age International Publishers, Tamilnadu Agriculture University, Coimbtore.

Shah B., Mhaskar and Parabia M.H. (2002): Prathmik Arogya ma Vanaspati Aushadhiyo. Arogya Karyakaro mate ni pustika.

Shah G.L. (1978): **Flora of Gujarat State (Volume I-II)**. Sardar Patel University, Vvnagar, Gujarat, India

Shah N.C. (compd.) (1993): **Bharat Bhaishjya Ratnakar- Encyclopaedia of Ayurvedic Formulations** (Volumes I-V) (3rd edn.) B.Jain Publishers (P) Ltd., New Delhi.

Shastri G.M. (Trans.) (2000): **Yog Ratnakar (Volumes I - II)** (2nd edn). Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Shastri G.M.(Trans.) (1981): **Bhav Parakash (Volumes I – II)** (4th edn.). Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Shastri K.G. (Trans.)(1957): **Shushrut Ayurveda (Volume I-II)** (2nd Edn.). Sastu Sahitya Vardhak Karyalaya, Bhadra, Ahmedabad.

Sumy, Ved D.K. and Krishnan (2000): **Tropical Indian Medicinal Plants Propagation Methods** (1st Edn.) Foundation for Revitalization of Local Health Traditions, Banglore.

Vaidya B.G. (1965): **Nighantu Adarsh (Volume I-II)** (2nd Edn.) Shri Swami Atmanand Saraswati Ayurvedic Sahkari Pharmacy Ltd. Surat.

Wagner H. and Bladt S. (1996): **Plant drug Analysis- A Thin layer Chromatography Atlas** (2nd Edn.). Springer Publications

Waller G.R. and Nowacki E.K. (1978): **Alkaloid Biology and Metabolism in Plants**. Plenum Press, New York, London.

Wallis ( ) : Pharmacognosy

Warrier P.K., Nambier V.P. K. and Ramakutty C. (ed.) (1994): **Indian Medicinal Plants. A Compendium of 500 species (Volume I to V).** Orient Longman Limited, Hyderabad,A.P. India.

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ELIGIBILITY, EXAMINATION AND PASSING RULES FOR

APGDMP-1

The duration of the course shall be One-year, full time. Academic year shall be divided into two semesters. Teaching and examinations schedules shall be as per semester system.

APGDMP-2

Eligibility: M.Sc. in any Biological Science, M.Sc. Chemistry, M.Sc. (Ag), Horticulture, M.Pharm and M.D. with sufficient interest in study of Medicinal plants as to be adjudged by the entrance test and personal interview.

For persons having non-botanical background an intense crash course of one week will be arranged for selected candidates.

APGDMP – 3

Candidates desirous of appearing at any semester examination of the **(APGDMP)** course must forward their applications in the prescribed form to the Registrar, through the coordinator, on or before the prescribed dates.

APGDMP – 4

No candidate shall be permitted to re-appear at any semester examination, which he/she has already passed.

APGDMP – 5

The marks for each theory and practical course, their distribution between internal and External examinations, teaching schedule, examination duration etc. will be as per Course Management and Evaluation scheme.

APGDMP – 6

A candidate shall be allowed to join the second semester irrespective of his/her result of the first semester.

APGDMP – 7

If a candidate fails in certain heads in first semester examination, he/she can re–appear in those heads along with second semester examination.

APGDMP – 8

The standard of passing the **(APGDMP)** examination will be as under

To pass any semester examination of the **(APGDMP)**, candidate must obtain at least 40% marks in the University examination and 40% marks in the aggregate of University and Internal examination in each course of Theory and Practical, including Project Viva, if any.

APGDMP – 9

Class shall be awarded to the successful candidate at the end of Second semester examinations on the basis of:

(A) Aggregate of marks obtained by the candidate in the external evaluations of the two semester examinations of that particular year and

(B) Aggregate of marks obtained by the candidate in the (external + internal)) evaluation of two semester examinations of that particular year.

Award of class

i) A successful candidate will be placed in FIRST CLASS WITH DISTINCTION, if he/she obtains 70% marks under both (A) and (B) above.

ii) A successful candidate will be placed in FIRST CLASS, if he/she obtains 60% or more but less then 70% marks under both (A) and (B) above.

iii) A successful candidate will be placed in SECOND CLASS, if he/she obtains 48% or more but less then 60% marks under both (A) and (B) above.

iv) A successful candidate will be placed in PASS CLASS, if he/she obtains 40% or more but less then 48% marks under both (A) and (B) above.

APGDMP –10

A candidate who fails in any semester shall have an option to reappear in the subjects of failure or Full examination. However, candidates appearing in the part examination shall not be entitled for any class and such candidates shall be placed in PASS CLASS only. In such case, credit marks shall be considered equivalent to percentage of aggregate marks for passing for passing for that particular year.

Course Management & Evaluation

The minimum teaching (actual) per semester will be of 14 weeks excluding examinations

First Semester: Four Theory Courses
Three Practicals/ week

Second Semester: Two Theory Courses
Two Practicals/ week
Project work

Each course shall have 4 hours per week teaching

Each practical shall have 4 hours per practical

Weekly load will be 28 hrs per week

Examination pattern:

70:30 External: Internal pattern will be followed. Internal evaluation will be as done at P.G. level

There will be external examination at the end of each semester

Each candidate shall carryout project work of 200 marks. A committee consisting internal and external examiner will evaluate this. The candidate will defend his/her work at the time of Viva-voce & presentation session. The project work evaluation will carry only external marks.

Industrial visits and field excursions will also be carried out during the course study.

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Proposed Teaching and Evaluation Scheme for APGDMP

Semester-I

Paper No.	Paper title	Teaching schedule (hrs./wk)		University Exam Theory/ Practical		Internal Exam. Theory/ Pract.	Total Theory/ pract.
		Lecture	Pract.	Duration	Marks	Marks	Marks
DMP 101	Elements of Herbology	4		3	70	30	100
DMP 102	Ethnomedicinal studies & medicinal plants	4		3	70	30	100
DMP 103	Raw material Resources & Collection, Primary health care and herbs	4		3	70	30	100
DMP 104	Phytochemistry & Pharmacological screening of herbal drugs	4		3	70	30	100
DMP 105	Practicals		12	5	210	90	300
	TOTAL	**16**	**12**		**490**	**210**	**700**

Semester-II

Paper No.	Paper title	Teaching schedule (hrs./wk)		University Exam Theory/ Practical		Internal Exam. Theory/ Pract.	Total Theory/ pract.
		Lecture	Pract.	Duration	Marks	Marks	Marks
DMP 201	Herbal raw material processing & their products	4		3	70	30	100
DMP 202	Quality control & Phytochemical methods	4		3	70	30	100
DMP 203	PROJECT WORK	12			200		200
DMP 204	Practicals		8	5	210	90	300
	TOTAL	**20**	**8**		**490**	**210**	**700**