

**NATIONAL COLLEGE (AUTONOMOUS), TIRUCHIRAPPALLI - 620 001**

Nationally Accredited at 'A' Level by NAAC



**B. Sc. BOTANY  
COURSE STRUCTURE UNDER C.B.C.S.**

(Applicable to the candidates admitted from the academic year 2016-17 onwards)

| Sem.       | Part         | Course                                   | Course Title  | Ins. hours /week | Credit    | Exam Hrs. | Marks |          |   | Total      |
|------------|--------------|--|---|------------------|-----------|-----------|-------|----------|---|------------|
|            |              |  |   |                  |           |           | CIA   | External |   |            |
|            |              |  |   |                  |           |           |       | W        | O |            |
| <b>I</b>   | I            | Language -I -(U!6T1/H1/S1)               | Tamil/Hindi/Sanskrit                                | 6                | 3         | 3         | 25    | 75       | - | 100        |
|            | II           | English -I (U16E1)                       | English   | 6                | 3         | 3         | 25    | 75       | - | 100        |
|            | III          | Core Course-I (U!6BO-1)                  | Algae and Bryophytes                                | 5                | 5         | 3         | 25    | 75       | - | 100        |
|            |              | Core Course-II - (U!6BO2P)               | Practicals (CC-I)*                                  | 3                | -         | -         | -     | -        | - | -          |
|            |              | First Allied Course-I - (U!61ACH1)       | Chemistry-I   | 5                | 3         | 3         | 25    | 75       | - | 100        |
|            |              | First Allied Course-II - (U!61ACH2P)     | Chemistry Practical (1AC-I)                         | 3                | -         | -         | -     | -        | - | -          |
|            | IV           | Environmental studies- (U!6ES)           | Environmental studies                               | 2                | 2         | 3         | 25    | 75       | - | 100        |
|            | <b>Total</b> |  |   | <b>30</b>        | <b>16</b> |           |       |          |   | <b>500</b> |
| <b>II</b>  | I            | Language Course-II - (U!6T2/H2/S2)       |   | 6                | 3         | 3         | 25    | 75       | - | 100        |
|            | II           | English-II (U16E2)                       |   | 4                | 2         | 3         | 25    | 75       | - | 100        |
|            |              | Communicative English-I (U16CE1))        | Course-I (CEC-I)                                    | 2                | 1         | 3         | 25    | 70       | 5 | 100        |
|            | III          | Core Course-II - (U16BO2P)               | Practical (CC-III)                                  | 3                | 6         | 3         | 25    | 70       | 5 | 100        |
|            |              | Core Course-III - (U16BO3)               | Fungi, Lichen, Plant Pathology and Plant Protection | 5                | 5         | 3         | 25    | 75       | - | 100        |
|            |              | First Allied Course-II - (U16ACH2P)      | Chemistry Practical (1AC-III)                       | 3                | 3         | 3         | 25    | 70       | 5 | 100        |
|            |              | First Allied Course-III - (U16ACH3)      | Chemistry -II                                       | 5                | 3         | 3         | 25    | 75       | - | 100        |
|            | IV           | Skill Based Elective-I (U16SBE1)         | Computer Application-I                              | 2                | 2         | 3         | 25    | 75       | - | 100        |
|            | <b>Total</b> |  |   | <b>30</b>        | <b>25</b> |           |       |          |   | <b>800</b> |
| <b>III</b> | I            | Language -III - (U16T3/H3/S3)            |   | 6                | 3         | 3         | 25    | 75       | - | 100        |
|            | II           | English -III (U16E3)                     |   | 6                | 3         | 3         | 25    | 75       | - | 100        |
|            | III          | Core Course-IV - (U16BO4)                | Pteridophytes, Gymnosperms & Paleobotany            | 4                | 4         | 3         | 25    | 75       | - | 100        |
|            |              | Core Course-V - (U16BO5P)                | Practicals (CC-IV)*                                 | 3                | -         | -         | -     | -        | - | -          |
|            |              | Second Allied Course-I - (U16AZYI)       | Zoology -I  | 4                | 3         | 3         | 25    | 75       | - | 100        |
|            |              | Second Allied Course-II- (U162AZY2P)     | Zoology Practical (2AC-I)                           | 3                | -         | -         | -     | -        | - | -          |
|            | IV           | Skill Based Elective Course-II (U16SBE2) | Computer Application-II                             | 2                | 2         | 3         | 25    | 75       | - | 100        |
|            |              | Skill Based Electives-III- (U16SBE3P)    | Computer Applications-III (DTP Lab)                 | 2                | 2         | 3         | 25    | 70       | 5 | 100        |
|            |              | <b>Total</b>                             |   |                  | <b>30</b> | <b>17</b> |       |          |   |            |

| Sem. | Part | Course                               | Course Title                                    | Instru. hours/ week | Cred- it   | Exam hr    | Marks |          |   | Total |             |
|------|------|--------------------------------------|---|---------------------|------------|------------|-------|----------|---|-------|-------------|
|      |      |                                      |   |                     |            |            | CIA   | External |   |       |             |
|      |      |                                      |   |                     |            |            |       | W        | O |       |             |
| IV   | I    | Language -IV (U16T4/H4/S4)           |   | 6                   | 3          | 3          | 25    | 75       | – | 100   |             |
|      | II   | English -IV-( U16E4)                 |   | 4                   | 2          | 3          | 25    | 75       | – | 100   |             |
|      |      | Communicative English –II-( U16CE2)  | Course-I (CEC-II)                               | 2                   | 1          | 3          | 25    | 70       | 5 | 100   |             |
|      | III  | Core Course-V (U16BO5P)              | Practicals (CC-VI)                              | 3                   | 5          | 3          | 25    | 70       | 5 | 100   |             |
|      |      | Core Course-VI (U16BO6)              | Anatomy & Embryology                            | 4                   | 4          | 3          | 25    | 75       | – | 100   |             |
|      |      | Second Allied Course -II (U16AZY2P)  | Zoology Practicals (2AC-III)                    | 3                   | 3          | 3          | 25    | 70       | 5 | 100   |             |
|      |      | Second Allied Course-III -( U16AZY3) | Zoology -II                                     | 5                   | 3          | 3          | 25    | 75       | – | 100   |             |
|      | IV   | Non-Major Elective I-(U16NMBOI)      | Horticulture                                    | 2                   | 2          | 3          | 25    | 75       | – | 100   |             |
|      |      | Value Education – (U16VE)            | Value Education                                 | 1                   | 2          | 3          | 25    | 75       | – | 100   |             |
|      |      |                                      | <b>Total</b>                                    |                     | <b>30</b>  | <b>25</b>  |       |          |   |       | <b>900</b>  |
| V    | III  | Core Course-VII (U16BO7)             | Cell and Molecular Biology                      | 5                   | 5          | 3          | 25    | 75       | – | 100   |             |
|      |      | Core Course-VIII (U16BO8)            | Morphology, Taxonomy and Economic Botany        | 5                   | 5          | 3          | 25    | 75       | – | 100   |             |
|      |      | Core Course – Elective-I (U16BO9E)   | Microbiology                                    | 5                   | 4          | 3          | 25    | 75       |   | 100   |             |
|      |      | Core Course-Elective-II ( U16BO10E)  | Biotechnology                                   | 5                   | 4          | 3          | 25    | 75       |   | 100   |             |
|      | IV   | Core Course-IX ( U16BO11P)           | Practicals (CC-VII)*                            | 3                   | --         | 3          |       |          |   |       |             |
|      |      | Core Course-X( U16BO12P)             | Practicals (CC-VIII)*                           | 3                   | --         | 3          |       |          |   |       |             |
|      |      | Non-Major Elective -( U16NMBO2)      | Biofertilizer, and Biopesticides                | 2                   | 2          | 3          | 25    | 75       | – | 100   |             |
|      |      | Soft Skills – (U16SS)                | Soft Skills                                     | 2                   | 2          | 3          | 25    | 75       |   | 100   |             |
|      |      |                                      | <b>Total</b>                                    |                     | <b>30</b>  | <b>22</b>  |       |          |   |       | <b>600</b>  |
| VI   | III  | Core Course-(U16BO11P)               | Practicals (CC-XIII & XIV )                     | 3                   | 5          | 3          | 25    | 70       | 5 | 100   |             |
|      |      | Core Course-(U16BO12P)               | Practicals (CC-XIII)                            | 3                   | 6          | 3          | 25    | 70       | 5 | 100   |             |
|      |      | Core Course-XI-(U16BO13)             | Genetics Plant Breeding and Evolution           | 6                   | 6          | 3          | 25    | 75       | – | 100   |             |
|      |      | Core Course-XII-(U16BO14)            | Plant Physiology and Ecology                    | 6                   | 6          | 3          | 25    | 75       | – | 100   |             |
|      |      | Core Course -XIII-(U16BO15)          | Biochemistry, Biophysics and Bioinstrumentation | 6                   | 6          | 3          | 25    | 75       | – | 100   |             |
|      |      | Core Course Elective-III (U16BO16E)  | Biostatistics and Bioinformatics                | 5                   | 4          | 3          | 25    | 75       | – | 100   |             |
|      | V    | Gender Studies - (U16GS)             | Gender Studies                                  | 1                   | 1          | 3          | 25    | 75       | – | 100   |             |
|      |      | Extension Activities-(EA)            |   | –                   | 1          | –          | –     | –        | – | –     |             |
|      |      |                                      | <b>Total</b>                                    |                     | <b>30</b>  | <b>35</b>  |       |          |   |       | <b>700</b>  |
|      | V    |                                      |   |                     |            |            |       |          |   |       |             |
|      |      |                                      | <b>Grand Total</b>                              |                     | <b>180</b> | <b>140</b> |       |          |   |       | <b>4100</b> |

|                       |            |
|-----------------------|------------|
| Language              | 4 Courses  |
| English               | 4 Courses  |
| Communicative English | 2 Courses  |
| Core Course           | 13 Courses |
| Core Course Elective  | 3 Courses  |
| Allied Course         | 6 Courses  |
| Skill Based Elective  | 3 Courses  |
| Non-Major Elective    | 2 Courses  |
| Environmental Studies | 1 Course   |
| Value Education       | 1 Course   |
| Soft Skill            | 1 Course   |
| Gender Studies        | 1 Course   |
| Extensive Activities  | 1 Course   |
| <b>Total</b>          | 42 courses |

**CIA:** Continuous Internal Assessment, **W:** Written; **O :** Oral

\* Examinations will be in the even semester

\*\* Allied Botany Theory and Practicals are offered for Zoology students at the Department of Botany.

There will be oral test for all Practical Examination and Communicative English Courses. The oral test will carry 5 marks in the external component.

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**j kpha;Tj ;J i w> Nj rpa ffy;Y}up (j ddhl rp)> j pUrrpuhggsSp - 1.**

**Kj w; gUtk;**

**j hs; nkhogghl k; - 1 nraAs; (, ffhyk)> ci uei l> rWfi j> , yffpatuyhW  
U16T1**

**fwgpfFk; fhyk; 6 kz p**

**j ugGssps; 3**

**myF 1:** ghuj pahu; - guknghUs; thoj ;J  
ghuj ij hrd; - eb;fNs nrhy;Yqfs;  
ftpkz p - Nfhtpy; toghL  
glLfNfhl i l ahu; - xz z hapUffz k; mz z hrrp  
ehkf;fyphu; - Rj ej muk; ahJ?

**myF 2:** fz z j hrd; - Ntz ;Lk; Ntz ;Lk;  
thyp - Gddi f kddd;  
i tuKj ;J - ghuj p epi dffggLfphwd;  
K.Nkj j h - RtUk; geJk;  
mgJy; uFkhd; - j twhd vz ;

**myF 3: ci uei l:**

1. gukgi ufFz k; - c .Nt.rh
2. fy;tp - ahogghz k; nghddkgyggps; i s
3. , yffpaKk; r%fKk; - v] ;i tahGupggps; i s
4. fi yAk; fwgi dAk; - uh.gp.NrJggps; i s
5. Fws; fhLk; newp - fpM.ng.tpRtehj k;
6. , awi ff; fhLrfs; - fp.th.[feehj d;
7. rka , yffpaqfs;py; mwnewp - FdwfFb mbfshu;

**myF 4: rWfi j:**

1. j ei j Ak; kfDk; - fy;fp
2. fl TS k; fej rhk;ggps; i sAk;- GJ i kggj j d;
3. ej pgj p tfflyhdhu; - mz z hJ i u
4. Kj ygpy; - e.gpr;%uj j p
5. fhfij c wT - R.rKj j muk;
6. kNdhghtk; - tyypfz z d;
7. kdij aej muk; - tpej d;
8. gri rffdT - yh.r. uhkhk;uj k;

**myF 5:** tyypdk; kpFk; , l qfs> tyypdk; kpfh , l qfs;  
, yffpa tuyhW (trdfdpi j> GJ ffdpi j> ci uei l> rWfi j kl;Lk)

ghl E)y; j kpa; - Kj wgUtk; - Nj rpa ffy;Y}up ntspaL  
, yffpatuyhW - Nj rpa ffy;Y}up ntspaL

**j kpha;Tj ;J i w> Nj rpa ffy;Y)up (j ddhl rp)> j pUrrpuhggsSp - 1.  
 , uz j hk; gUtk;**

**j hs; nkhogghl k; - 2 nraAs; (gfj p mw , yffpaqfs)> Gj pdk> , yffpa tuyhW.**

**U16T2**

**fwgpfFk; fhyk; 6 kz p**

**j ugGssps; 3**

**myF 1:** j pUQhdrkgej u; - j pUthi dffh gj pfk; - ki oahu; kpl whkO thS i l aha.  
 j pUehTffuru; - tpi k; j ljj gj pfk; - xdW nfhyhk; mtu; rpei j Aauti u  
 ngupahothu; - j pUtuqfk; ghRuk; 2 - kutbi aj; j kgpfF  
 FyNrfuu; - tj ;J tf; Nfhl ;L mkkhi d Ntz b epwwy; - j UJ auk;...10

**myF 2:** tssyhu; - j pUtUl gh - ngwhgNgW - Mth vdwi d MI nfhz ;J Us p.10  
 j hAkhdtu; - gdkhi y - gdkhi y j puspUff;...9  
 , NaRfhtpak; - c ti k top nraj p - fl Nyhuk; xUehs; VR epdwhu..  
 Fz qFb k] j hd; - epuhkaffz z p - 1-25 fz z pfs;

**myF 3:** ehdkz pffbi f; (ghl y; vz fs; 6> 10> 12> 16> 31> 38> 45> 56> 69> 75)  
 ehybahu; (ghl y; vz fs; 2> 29> 35> 77> 95> 109> 114> 172> 248> 269)  
 rWgQr%yk; (ghl y; vz fs; 9> 12> 16> 26> 32> 39> 63> 82> 85> 90)  
 , dpa i t ehwgJ: Kj y; gj ;J ghl yfs;

**myF 4:** Gj pdk; - fddpffh - uFehj d; Ji w ntsjalL

**myF 5:** , yffpa tuyhW (i rtk;i tz tk>rkz k>ngsj j k>fpmj ;J tk> Kfkj pak;  
 kwWk; Gj pdk; gwwpad kl ;Lk)

**ghl E)y;** j kpo; - , uz j hkgUtk; - Nj rpa ffy;Y)up ntsjalL.

fddpffh - nll j gj pggf ntsjalL> nr di d.

, yffpatuyhW - Nj rpa ffy;Y)up ntsjalL.

**j kpha;Tj ;J i w> Nj rpa ffy;Y}up (j ddhl rp)> j pUrrpnhggssp - 1.**

**%dwhk; gUtk;**

**j hs; nkhogghl k; - 3 nraAs; (fhggjak)> ehl fk> , yffpatuyhW**

**U16T3**

**fwgpfFk; fhyk; 6 kz p**

**j ugGssps; 3**

**myF 1:** nryggj pfhuk; - elggi l fhi j

kz pNkfi y - ghj j puk; ngww fhi j

**myF 2:** fkguhkhaz k; - Aj j fhz l k; - , ej purj ;J ti j ggl yk;

ngupaGuhz k; - fz z gg ehadhu; Guhz k;

**myF 3:** Nj kghtz p - tsd; rdij j gl yk;

rhwgGuhz k; - khDfFg; gpi z epdw gl yk;

ghQrhy p rgj k; - #j hl l r; rUffk;

**myF 4: ehl fk;** xj j pi f - m. , uhkrhk p (vdrngvr; ntsjalL)

**myF 5: , yffpatuyhW** (fhggjak> Guhz k> ehl fk; gwwpad kl l k)

ghl E}y; j kp; - %dwhkgUtk; - Nj rpa ffy;Y}up ntsjalL.

xj j pi f - m. , uhkrhk p (vdrngvr; ntsjalL)

, yffpatuyhW - Nj rpa ffy;Y}up ntsjalL.

**j kpha;Tj ;J i w> Nj rpa f;fy;Y}up (j d dhl rp) > j pUrrpuhggsSp - 1.**

**ehd;fhk; gUt k;**

**j hs; nkhogghl k; - 4 nraAs; (gz i l a , yffpak> , yffpatuyhW> nkhongaugG)**

**U16T4**

**fwgpfFk; fhyk; 6 kz p**

**j ugGssps; 3**

**myF 1:**

- ewwpi z :
1. Ntu; gız p ntj pu;J - ghi y - , sq;fıudhu;
  2. nıyUk; gyUK; fi l f;fz ; - neaj y; - c Nyhrrdhu;
  3. muıfhy; khwpa mk; fz ; - kUj k; kpi sf;fıphdeyNt l ; dhu;
  4. , i y , y gpl tk;Kyı y - tıpf;fı l Ngi j g; ngUqfz z dhu;
  5. Gj y;td; <dw Gq;fz ; - FwıQrp

- FWenj hi f :
1. nfhqF Nj u; thofı f - FwıQrp - , i wadhu;
  2. , bfFq; Nfsıu; - FwıQrp - ntssıptıı pahu;
  3. ahuz qFwwı d fı l Ny - neaj y; - mk;%tdhu;
  4. khup ahkgydd - neaj y; - Fdwıpadhu;
  5. c kz u; Nrue;J fııpej kUq;fııd; - ghi y - ngUq;fLqNfh
  6. Mı i k Gi uAk; - ghi y - XNuUotdhu;
  7. Ksıj apı; gpi rej - Kyı y - \$ı Yıu; fııphu;
  8. , sı k ghuhu - Kyı y - xı;\$ıu; khırhj j pahu;
  9. Ntkgııd; i gq;fha; - kUj k; - kpi sf;fıej dhu;

**myF 2:**

- mfehDıW:
1. gi dj j ıus; mdd - FwıQrp - guz u;
  2. gi rgL gri r - Kyı y - kJ i u kssdhu;
  3. , ki k c yfj ;J , i rnahLk; - kUj k; - nry;YıufNfhııııd;
  4. j pi uc oe;J mi r, a - neaj y; - c Nyhrrdhu;
  5. msıpeı y nghwhmJ mkupa - ghi y - ngUq;fLqNfh

- fıyıj nj hi f:
1. Rı uj nj hB, Nfsha; - FwıQrp
  2. fıhu Mug; ngaj fı b nfhs; - Kyı y
  3. tıııF eıı; mtııı; eııyk; gfutu; - kUj k;

4. khkyu; Kz;l fk; - neaj y;
5. muj ha mwndaj p - ghi y

**myF 3:**

- GwehD}W :
1. xUehl; nryyyk; - ghl hz ; - xsi tahu;
  2. gi lgGggy gi l j J - nghJ tpay; - mwpi l ekgp
  3. , i sNahu; #l hu; - nghJ tpay; - Fl thapy; flj j dhu;
  4. gyrhdwNu - nghJ tpay; - eumt&c j ; j i yahu;
  5. fhaney; mWj J f f t s q ; n f h s p N d - ghl hz ; - g r p u h e i j a h u ;

- j pUfFws; 1. mwd; tyAWj j y> 2.gz Gi l i k> 3. xOffFK i l i k>  
4. thaj k> 5. C o> 6.nrhy;tdi k

**myF 4:** Kyi ygghl L KOi kAk;

**myF 5:** , yf;f;patuyhW (gj jndz ; Nkwfz f;F> f b f ; f z f ; F ) > nkhojngaugG>  
nghJ f;f;l i u

**ghl E}y;** 1. j kp; - ehd;fhkgUtk; - Nj r p a f f y ; Y } u p n t s p a L .  
2. , yf;f;patuyhW - Nj r p a f f y ; Y } u p n t s p a L .



Semester – I

**PAPER 1 – PROSE, SHORT STORY AND GRAMMAR****PROSE****Prescribed Text Book**

INDI GADYA PRABHAKAR, Ed. Dr. Hiranma Shiksha Bharathi, shmiri Gate, Delhi-06.

**Prescribed Lessons**

- |                                    |    |                       |
|------------------------------------|----|-----------------------|
| 1. Bharat Eke hay                  | By | Ramdhari Singh Dinkar |
| 2. Japan Mein kaya dekka           | By | Premchand             |
| 3. Jeevan ke theen pradhan baathey | By | Aacharya Vinobabavey  |

**SHORT STORY****Prescribed Text Book**

KAHANI VIVDHA, V. Mahadeven, Trichy.

**Prescribed Lessons**

- |                  |    |                           |
|------------------|----|---------------------------|
| 1. Idhaah        | By | Premchand                 |
| 2. Usne kaha tha | By | chandradhar Sharma guleri |

**GRAMMER**

Prescribed Portion

1. Noun
2. Verb
3. Gender (Change the gender only)
4. Number (Change the number only)
5. Aarth and Ultey Sabdh Likeye

**Reference Book**

VYAKARANPRADEEP

By Ramdev, Saraswathi Prakashan, Varansi

**UNITISED SYLLABUS**  
**PAPER 1 – PROSE, SHORT STORY AND GRAMMAR**

Semester – I

Time 3 Hrs

Max Marks 75

**UNIT- 1**

- 1.Noun
- 2.Bharath Eke Hai
- 3.Gender

**UNIT- 2**

- 1.Gender
- 2.Idhgaah
- 3.Jaapan mein kya dheka

**UNIT- 3**

- 1.Jeevan ke theyeen pradhan bhathey
- 2.Idhgaah
3. Number

**UNIT-4**

- 1.Ling Badhaliye, Vachan Badhaliye
2. Verb
- 3.Aarth (Meanings) Likeye

**UNIT-5**

- 1.Aarth (Meanings) Likeye
- 2.Ultey Sabdh (opposite) Likeye

## QUESTION PAPER PATTERN

## SECTION- A (20 Marks)

- I 1. Change the Gender (Ling) **10/12** (10Marks)
2. Change the Number (Vachen) **10/12**

## SECTION- B (25 Marks)

## II. One Question from each unit (either or)

- |    |                  |              |         |
|----|------------------|--------------|---------|
| 1. | From Prose       | (1 out of 2) | 5 Marks |
| 2. | From Short story | (1 out of 2) | 5 Marks |
| 3. | From Grammar     | (1 out of 2) | 5 Marks |
| 4. | Meanings 5 nos   | (Either or)  | 5 Marks |
| 5. | Opposites 5 nos  | (Either or)  | 5 Marks |

## SECTION- C (3x10=30 Marks)

III. One Question from each unit (**Three out of five**)

- 1. From Prose**
- From Prose
- From Short Story
- From Grammar
- From Grammar

**U16H2****Semester – II****PAPER II – COMPREHENSION, DRAMA, GRAMMAR-II, GENERAL ESSAY AND  
TRANSLATION – I**

**COMPREHENSION** : **General Paragraph from Anuvadh**  
**Abyas Bah – 3, Dakshina Bharath Hindi**  
**Prachar Sabha, Chennai – 17.**

**DRAMA**

:

**Prescribed Text Book** : **Subodh Hindi patamala – 2**  
**Dakshina Bharath Hindi**  
**Prachar Sabha, Chennai – 17.**

**Prescribed Portion** : **APPOORVA THYAG**  
**By Balashori Reddy**

**GRAMMAR – II**

**Prescribed Portion** : **1. Pronoun**  
**2. Adjectives**  
**3. Adverb**  
**4. Case Endings**

(Definition and Name of types only)

5. Paryavachaye Sabdh

**Reference Book** : **VYAKARANPRADEEP**

By Ramdev, Saraswathi Prakashan, Varansi

**GENERAL ESSAY**

**Prescribed Book** : **Subodh Hindi Rachna – 2**

**Dakshina Bharath Hindi**

**Prachar Sabha, Chennai – 17**

**Prescribed Portions** : **1. Priya Theohar**

**2. Gaayi**

**3. Samachar pathra**

**TRANSLATION -1**

**Prescribed Book** : **Anuvadh Abyas Bah – 1,1 to 10 lessons**

**Dakshina Bharath Hindi**

**Prachar Sabha, Chennai – 17**

**Prescribed Portions** : **1 to 10 Lessons**

**UNITISED SYLLABUS****PAPER II – COMPREHENSION, DRAMA, GRAMMAR-II, GENERAL ESSAY AND  
TRANSLATION – I**

Semester – II

Time 3 Hrs

Max Marks 75

**UNIT- 1**

Comprehension  
Aproova Thyag  
Pronoun  
Translation 1,2

**UNIT- 2**

Comprehension  
Aproova Thyag  
Adjectives  
Translation 3,4

**UNIT- 3**

Comprehension  
Priya Theohar  
Adverb  
Translation 5,6

**UNIT-4**

Comprehension  
Gaayi  
Case Endings  
Translation 7,8

**UNIT-5**

Comprehension  
Samachar pathra  
Paryaivachaye Sabdh  
Translation 9,10

**QUESTION PAPER PATTERN****SECTION- A (20 Marks)****I . Answer all the Questions:**

- (a) Write Same meaning (Paryavachi) 10 x 1 = 10  
(Each word two meaning must) – 10/12
- (b) Answer in one sentence (Any 5) 5 x 2 = 10

**SECTION- B (25 Marks)**

**II. One Question from each unit (either or)**

- |                                   |              |         |
|-----------------------------------|--------------|---------|
| 1. From Drama                     | (1 out of 2) | 5 Marks |
| 2. From Grammar                   | (1 out of 2) | 5 Marks |
| 3. From Grammar                   | (1 out of 2) | 5 Marks |
| 4. Translation (Hindi to English) | (Either or)  | 5 Marks |
| 5. Translation (English to Hindi) | (Either or)  | 5 Marks |

**SECTION- C (3x10=30 Marks)****III. One Question from each unit (Three out of five)**

1. From General Essay
2. From General Essay
3. From Grammar
4. From Grammar
5. Comprehension



**U16H3**

**SEMESTER – III**

**PAPER III – MODERN AND MEDIEVAL POETRY, DIALOGUE WRITING AND  
TRANSLATION – II**

**1. POETRY**

**Book Name : 1. KAVYA SAURABH**

**2. SUBODH HINDI – 2**

**Pub. Dakshina B. Hindi P.Sabha**

**Chennai.**

**Prescribed Lessons : 1. Samaya**

**2. Chhah**

**1.Kabir key Dhohay 1to 5**

**2.Thulsi key Dhohay 1to 5**

**3.Rahim key Dhohay 1 to 5**

**2. DIALOGUE WRITING : 1. Doctor Aur Marij**

**2. Kithab key Dhukhan**

**3.Pariksha key Bharey Mein**

**3. TRANSLATION - II**

**Prescribed Book : Anuvadh Aabyas Bah – 1,  
Dakshina Bharath Hindi  
Prachar Sabha, Chennai – 17**

**Prescribed Portions : 11 to 20 Lessons**

**UNITISED SYLLABUS****PAPER III – MODERN AND MEDIEVAL POETRY, DIALOGUE WRITING AND  
TRANSLATION – II**

Semester – III

Time 3 Hrs

Max Marks 75

**UNIT- 1**

Samya  
Kabir key Dhohay  
Translation 11, 12

**UNIT- 2**

Chhah  
Thulsi key Dhohay  
Translation 13, 14

**UNIT- 3**

Rahim key Dhohay  
Dialogue – Doctor Aur Marij  
Translation 15, 16

**UNIT-4**

Dialogue – Kithab key Dhukan  
Poetry Review  
Translation 17, 18

**UNIT-5**

Dialogue – Parisha key Bharey mein  
Translation 19,20

**QUESTION PAPER PATTERN****SECTION- A (20 Marks)**

I . Answer in one sentence 10 x 2 = 20 Marks

**SECTION- B (25 Marks)**

II. One Question from each unit (either or)

1. Annotation from modern poetry (1 out of 2) 5 Marks
2. Annotation from modern poetry (1 out of 2) 5 Marks
3. Short Notes from Poetry (1 out of 2) 5 Marks
4. Translation (Hindi to English) (Either or) 5 Marks
5. Translation (English to Hindi) (Either or) 5 Marks

**SECTION- C (3x10=30 Marks)**

III. One Question from each unit (Three out of five)

Summary of Modern Poetry

1. Summary of Medieval Poetry
2. Summary of Medieval Poetry
3. Dialogue Writing
4. Dialogue Writing

**U16H4****SEMESTER - IV****PAPER IV – FUNCTIONAL HINDI, GENERAL ESSAY, GRAMMAR – III AND  
TRANSLATION – III****1. LETTER WRITING**

**Prescribed Book** : **Abinav Patralekhan**  
**Hindi Parchar Sabha**  
**Chennai.**

**Prescribed Portion** : **1. Leave Letter**  
**2. Placing Order for Books**  
**3. Complaints Letter**  
**4. Permission Letter for Tour**

**2. TECHNICAL TERMS**

**Prescribed Book** : **Hindi Vatayan, by Dr.Chandra Mohan**  
**Vishavidyalay Prakashan, Varansi.**

**Prescribed Portion** : **Annexure enclosed**

**3. GENERAL ESSAY**

**Prescribed Book** : **Nibandh Praveshika, Dakshina Bharath**  
**Hindi**  
**Prachar Sabha, Chennai – 17**

**Prescribed Portions** : **1. Pushthakalaya**  
**2. Pradhusan**

### 3. Vidhyarthi Jeevan

#### 4. GRAMMAR – II

- Prescribed Portions :** 1. Tense (Kal parivarthan)  
2. Correct the Sentence (Sudha Keyjiye)
- Reference Book :** Vyakaranpradeep, by Ramdev, Saraswathi  
Prakashan, Varansi.

#### 5. TRANSLATION – III

- Prescribed Book :** Anuvadh Abyas Bah – 2,  
Dakshina Bharath Hindi  
Prachar Sabha, Chennai – 17
- Prescribed Portions :** 1 to 10 Lessons

**UNITISED SYLLABUS****PAPER IV – FUNCTIONAL HINDI, GENERAL ESSAY, GRAMMAR – III AND  
TRANSLATION – III**

Semester – IV

Time 3 Hrs

Max Marks 75

**UNIT- 1**

Leave Letter  
Technical Terms  
Pushthakalaya  
Translation 1,2

**UNIT- 2**

Placing Order for Books  
Technical Terms  
Pradhusan  
Translation 3,4

**UNIT- 3**

Compliant Letter  
Vidhyarthi Jeevan  
Technical Phrases  
Translation 5,6

**UNIT-4**

Permission Letter for Tour  
Technical Phrases  
Kal Parivarthan (Change the Tense)  
Translation 7,8

**UNIT-5**

Kal Parivarthan (Change the Tense)  
 Sudha Keyjiye ( Correct the Sentence)  
 Translation 9,10

**QUESTION PAPER PATTERN****SECTION- A (20 Marks)****I . Answer all the Questions:****10x2 = 20 Marks**

Write 10 Technical Terms in Hindi 10/12 (Only Designation)

**SECTION- B (25 Marks)****II. One Question from each unit (either or)**

- |   |              |         |
|---|--------------|---------|
| 1. Change the Tense                           | (5 out of 7) | 5 Marks |
| 2. Correct the Sentence                       | (5 out of 7) | 5 Marks |
| 3. Technical Phrases (English to Hindi) 5 nos | (Either or)  | 5 Marks |
| 4. Technical Phrases (Hindi to English) 5 nos | (Either or)  | 5 Marks |
| 5. Translation (Hindi to English)             | (Either or)  | 5 Marks |

**SECTION- C (3x10=30 Marks)****III. One Question from each unit (Three out of five)**

From General Essay

1. From General Essay
2. From Letter Writing
3. From Letter writing
4. Translation (10nos) English to Hindi



Subject Code:U16S1

National College (Autonomous) Tiruchirapalli  
Language Programme Part I Sanskrit Semester I  
Paper I - Sanskrit - I

(For the students admitted from the the academic year June 2016 onwards)

Time: 3 Hours

Maximum Marks: 75

## Unit I

देवनागरी लिपि: - परिचयः

- १। स्वराः (१५)
- २। व्यञ्जनानि (३३)
- ३। संयुक्ताक्षराणि
- ४। संयुक्ताक्षराणां लेखनप्रकारः
- ५। विसर्गस्य प्रयोगः तस्य उच्चारणप्रकारश्च।

## Unit II

कर्तृपदानि - परिचयः

- १। अकारान्त-शब्दाः (पुंलिङ्गः)  
देवः
- २। अकारान्त-शब्दाः (नपुंसकलिङ्गः)  
फलम्
- ३। लिङ्गाः - सामान्यविधिः  
अ। पुंलिङ्गः  
आ। स्त्रीलिङ्गः  
इ। नपुंसकलिङ्गः
- ४। लिङ्गः वचनम् विभक्तिः च  
केवलम् एकवचनम् बहुवचनम् च
- ५। अनुवाद-अभ्यासः -  
अ। आङ्गल/तमिल् भाषातः संस्कृते  
आ। संस्कृतात् आङ्गल/तमिल् भाषायाम्

## Unit III

१। क्रियापदानि (परिचयः)

- १। वर्तमानकाले परस्मैपदिनः घातवः  
अ। अन्यपुरुषः/प्रथमपुरुषः  
आ। मध्यमपुरुषः  
इ। उत्तमपुरुषः  
ई। एकवचनम्  
उ। बहुवचनम्।

## Unit III (continued)

|                              |   |
|------------------------------|---|
|                              | २। क्रियापदानि - धातवः -<br>एकवचन-बहुवचन-मात्रम्<br>अ। गम् (गच्छ्)<br>आ। पठ्<br>इ। क्रीड्<br>ई। वद् |
| ३। अव्ययाः                   | तत्र, अत्र, कुत्र, यत्र, तदा, यदा,<br>कदा, इदानीम्, शीघ्रम्, अपि,<br>सह, एव, तु, किम्, च (१५)       |
| ४। अन्ये अकारान्त-कर्तृपदानि | अश्वः, बालकः, सूर्यः, मनुष्यः, हस्तः,<br>अध्यापकः, इत्यादीनि (१०)                                   |
| ५। अनुवाद-अभ्यासः            | अ। आङ्गल/तमिल् भाषायाः संस्कृते<br>आ। संस्कृतात् आङ्गल/तमिल् भाषायाम्                               |

## Unit IV

|                                    |  |
|------------------------------------|--|
| १। विभक्ति-अन्त प्रत्ययानां आदेशाः | अ। चतुर्थी विभक्ति-प्रत्ययस्य -<br>अर्थम् इति आदेशः<br>आ। पञ्चमी विभक्ति-प्रत्ययस्य -<br>तः इति आदेशः      |
| २। तृतीया विभक्तिः                 | अ। सह सार्धम् साकं इति<br>अव्ययानां उपयोगः   |
| ३। प्रश्न-निर्माण-पदानि            | किम्, कुत्र, कथं, किमर्थं, कुतः, कदा   |
| ४। क्रियापदानि - (द्वितीय-स्तरः)   | वर्तमानकाले परस्मैपदिनः धातवः<br>भू (भव), कृ (कर), अस्,<br>धाव्, पठ्, आ-गच्छ्<br>केवलम् एकवचनम् बहुवचनम् च |
| ५। अनुवाद-अभ्यासः                  | अ। आङ्गल/तमिल् भाषायाः संस्कृते<br>आ। संस्कृतात् आङ्गल/तमिल् भाषायाम्                                      |

## Unit V

१। विशेषण-विशेष्यौ

अ। शुक्ल - नील - पीत - रक्त - हरित - कपिश -  
कृष्ण वर्णाः।

आ। संख्या-वाचक-पदानि (० तः ९ पर्यन्तम् मात्रम्)

इ। सुन्दरः - सुन्दरी - सुन्दरम् ,  
मधुरः - मधुरा - मधुरम् इत्यादयः।

२। विभक्तीनां पुनः परिचयः (द्वितीयस्तरः)

अकारन्त-शब्दः पुलिङ्गः/नपुंसकलिङ्गः

१। प्रथमा विभक्तिः

२। द्वितीया विभक्तिः

३। तृतीया विभक्तिः

४। चतुर्थी विभक्तिः

३। विभक्तीनां पुनः परिचयः (तृतीयस्तरः)

अकारन्त-शब्दः पुलिङ्गः/नपुंसकलिङ्गः

५। पञ्चमी विभक्तिः

६। षष्ठी विभक्तिः

७। सप्तमी विभक्तिः

८। सम्बोधन-प्रथमा विभक्तिः

४। सर्वनाम-पदानि (अन्यपुरुषः/प्रथमपुरुषः)

१। सः - एषः

२। सा - एषा

३। तत् - एतत्

प्रथमा विभक्तिः एकवचन-बहुवचन-मात्रम्

५। सर्वनामपदानि (उत्तमपुरुषः)

(मध्यमपुरुषः)

४। अस्मद्

प्रथमा विभक्तिः, षष्ठी विभक्तिः च

एकवचन-बहुवचन-मात्रम्।

६। अनुवाद-अभ्यासः

अ। आङ्गल/तमिल् भाषायाः संस्कृते

आ। संस्कृतात् आङ्गल/तमिल् भाषायाम्

Subject Code:U16S2

National College(Autonomous) Tiruchirapalli  
Language Programme Part I Sanskrit Semester II  
Syllabus - Paper II - Sanskrit - II

(For the students admitted from the academic year, June 2016 onwards)

Time: 3 Hours

Maximum Marks: 75

## Unit I

क्रियापदानि

१। पुनश्चर्या

लट् लकारे (वर्तमानकाले)  
पूर्वस्मिन् षाण्मासे अभ्यस्तानां  
क्रियापदानां द्विवचनेन साकं  
पुनश्चर्या  
द्विवचन-परिचयः - उपयोगः च

२। लृट् लकारः - भविष्यत्कालः

१। गम् (गच्छ)

२। पट्

३। वट्

४। पत्

५। लिख् (लेख्)

६। क्रीड्

७। आ - गम् (गच्छ्)

८। भू - भव

९। धाव्

१०। पा - पिब्

११। दृश् - पश्

१२। कृ - कर्

३। लृट् लकारः - भविष्यत्कालः (अधिकम्)

४। लृट् लकारः - भविष्यत्कालः (अधिकम्)

५। लृट् लकारः - भविष्यत्कालः (अधिकम्)

## Unit II

१। लृट् लकारे अभ्यस्तानां  
धातुरूपाणाम् अभ्यासः  
वाक्येषु उपयोगः  
अनुवाद-अभ्यासः च  
(संस्कृत-आङ्गल/तमिल्-संस्कृतेषु)

२। सर्वनामशब्दाः

१। अस्मद् शब्दः - पुनश्चर्या  
(त्रिषु वचनेषु)

### Unit III १। भोज्य-पदार्थ-नामानि

२। वार्तालापः

३। क्त-प्रत्यय-धातवः

२। युष्मद् शब्दः

(त्रिषु वचनेषु)

३। युष्मद्-शब्द-आधारित-

वाक्येषु लृट् लकार-क्रियापदानां

उपयोगः अनुवाद-अभ्यासः च

(संस्कृत-आङ्गल/तमिल्-संस्कृतेषु)

४। तद् शब्दः - त्रिषु वचनेषु

पुंलिङ्ग-मात्रम्।

५। सर्वनाम-शब्दान् (युष्मद्-तद्)

आहत्य वाक्येषु उपयोगः

अनुवाद-अभ्यासः।

(संस्कृत-आङ्गल/तमिल्-संस्कृतेषु)

धान्य-नामानि -

चणकः, मुद्गः, माषः, तण्डुलः,

जीरकम्, मरिचम्, लशुनम्

फल-नामानि -

जम्बीरम्, आमलकम्, दाडिमम्,

नारङ्गः, बदरम्, जम्बूफलम्, कदलीफलम्

शलाटुका-नामानि

आलुकम्, आर्द्रकम्, कन्दर्पः,

भोज्यपदार्थ-नामानि

ओदनम्, रोटिका, पोलिका

दुग्धम्, दधि, तक्रम्, नवनीतम्, घृतम्,

एतावता अभ्यस्त-शब्दानां वाक्येषु

उपयोगः - अनुवाद-अभ्यासः

(संस्कृत-आङ्गल/तमिल्-संस्कृतेषु)

गतः गता गतम्

पीतः पीता पीतम्

पठितः पठिता पठितम्

क्रीडितः क्रीडिता क्रीडितम्

धावितः धाविता धावितम्

पतितः पतिता पतितम्

क्त-प्रत्यय-धातवः

३। क्रियापदानि

४। तुमुन्नत-अव्ययाः

५। अनुवाद-अभ्यासः

आगतः आगता आगतम्  
लिखितः लिखिता लिखितम्  
खादितः, खादिता, खादितम्  
लट् लकारे एव -  
भक्ष्, खेल्, पाल्, तुल्,  
मार्, गण्, कथ्, क्षाल्,  
गन्तुम्, पातुम्, पठितुम्, क्रीडितुम्,  
धावितुम्, पतितुम्, लेखितुम्, भवितुम्,  
अर्चितुम्, खेलितुम्, चलितुम्, क्षालयितुम्,  
तुलयितुम्, मारयितुम्, गणयितुम्  
संस्कृतात् आङ्गले/तमिल् भाषायाम्,  
आङ्गलात् संस्कृते

#### Unit IV

१। कृषि-क्षेत्र-सम्बन्धीनि नामानि

२। काल-संबन्धीनि पदानि  
संख्यावाचकपदानि च

३। क्रियापदानि

४। नपुंसकलिङ्ग-कर्तृ-पदानि

५। अनुवाद-अभ्यासः

कृषकः, कृषीवलः, बलीवर्दः, वृषभः  
सस्यम्, धान्यम्, तृणम्, क्षेत्रम्, हलः  
बीजम्, आलवालम्, मेघः, जलदः,  
खेटः, ग्रामः, क्रयः, विक्रयः, हट्टः,  
आपणः, आपणिकः, व्यवसायः- इत्यादीनि  
a. प्रातः, मध्याह्नः, सायम्, रात्रिः  
b. समयलेखनम् - सपाद-सार्ध-पादोन-  
पदानाम् उपयोगः  
c. ऋतु(काल) नामानि  
वसन्तः, ग्रीष्मः, वर्षाः, शरद्, हेमन्तः, शिशिर  
d. संख्यावाचकपदानि - १ तः २५ पर्यन्तम्  
लट् लकारे -  
क्री, वि-क्री, रुह् (रोह), वर्ष्, वप्  
रच्, कृष् (कर्ष), वस्, अर्च्  
  
सस्यम्, धान्यम्, तृणम्, क्षेत्रम्, बीजम्,  
आलवालम्।  
  
संस्कृतात् आङ्गले/तमिल् भाषायाम्,  
आङ्गलात् संस्कृते

## Unit V

१। आकारान्त-स्त्रीलिङ्ग-पदानि

a। माला शब्दः

(एकवचन - बहुवचनमात्रम्)

b। अन्यानि स्त्रीलिङ्गपदानि

रमा, शाला, पेटिका, शिखा,

निशा, दिशा, बाला, सभा,

भार्या, स्वसा, नासिका

गत्वा, पठित्वा, क्रीडित्वा, पीत्वा, धावित्वा,

लिखित्वा, भक्षयित्वा, खेलित्वा, धारयित्वा,

पतित्वा, कृत्वा, चलित्वा, क्षालयित्वा,

पालयित्वा, अर्चयित्वा

२। क्त्वा प्रत्यय-अन्त-अव्ययाः

लृट् लकारे (एकवचन-बहुवचन-मात्रम्)

धार्, कथ्, क्षाल्, पाल्, तोल्

३। क्रियापदानि

a. स्वरसन्धिः

b. गुणसन्धिः

c. वृद्धि-सन्धिः

पाठ्य-पुस्तके दत्तानां पदानां परिचयः

संस्कृतात् आङ्गले/तमिल् भाषायां तथा

आङ्गलात् संस्कृते

४। सन्धि-प्रकरणम्

५। अनुवाद-अभ्यासः

Prescribed book:

. Saral Sanskrit Sikshak Part I, Bharatiya Vidya Bhavan (lessons 6 to 9, and 1)  
Mumbai 400007.

Reference:

Sanskrit for beginners, Dr Narasimhachari, M, and Dr Ramaratnam, S,  
N & R Publications, Chennai 600004.

Subject Code: U16S3

National College (Autonomous) Tiruchirapalli

Language Course Part I Sanskrit Semester III

Paper III - Sanskrit III

(For the candidates admitted from the academic year June 2016 onwards)

Syllabus

Time: 3 Hours

Maximum Marks: 75

Unit I

1. क्रियापदानि कर्तृपदानि च - पुनश्चर्या लट् लकारे लृट् लकारे च पठितानां पूर्वस्मिन् षाण्मासद्वये अभयस्तानां क्रियापदानां, कर्तृपदानां च पुनश्चर्या
2. शब्दाः(कर्तृपदानां परिचयः)
- १। इकारान्तः पुल्लिङ्गः कवि शब्दः  
तस्य केचन समानान्तशब्दाः च।  
एकवचनं तथा बहुवचनम् एव।  
हरिः, रविः, अरिः ऋषिः, पतिः, यतिः इत्यादयः।
- २। सर्वनामशब्दः  
दकारान्तः स्त्रीलिङ्गः तद् शब्दः  
एकवचनं तथा बहुवचनम् एव।
- ३। इकारान्तः स्त्रीलिङ्गः मति शब्दः  
तस्य एकवचनं तथा बहुवचनम् एव।  
तस्य केचन समानान्तशब्दाः - रुचिः, शान्तिः  
कीर्तिः, बुद्धिः, मुक्तिः इत्यादयः
- ४। उपर्युक्त-शब्दानां वाक्येषु उपयोगः  
अनुवाद-अभ्यासः च (संस्कृत-तमिल/संस्कृत-  
आङ्गल/आङ्गल-संस्कृतेषु)

Unit II

- क्रियापदानि
- १। लट् लकारः (वर्तमानकालः)
- २। लट् लकारः (वर्तमानकालः) - अधिकम्
- ३। लट् लकारः (वर्तमानकालः) -अधिकम्
- १। जप्  
२। चर्  
३। रक्ष्  
४। हस्  
५। वम्  
६। नम्  
७। दह्  
८। तप्

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९। वस्

१०। इच्छ्

५। क्रियापदानां वाक्येषु उपयोगः अनुवाद-अभ्यासः च - संस्कृतात् आङ्गले/तमिल् भाषायां अथवा आङ्गलात् संस्कृते वा।

## Unit III

१। क्रियापदानि

उपर्युक्त-क्रियापदानां वाक्येषु प्रयोगः

संस्कृतात् आङ्गले/तमिल् भाषायां अथवा आङ्गलात् संस्कृते वा।

२। नूतन-शब्दानां परिचयः

अकारान्त-आकारान्त-इकारान्त कर्तृपदानि क्रियापदानि च

३। वार्तालाप-परिचयः

मिश्रित्य वाक्येषु उपयोगः अनुवाद-अभ्यासः च उपर्युक्त-कर्तृपद-क्रियापदानि उपयुज्य छात्रेषु वार्तालाप-अभ्यासः

४। लृट् लकारः (भविष्यत्कालः)

नूतन-क्रियापदानि

१। अर्ज्

२। दण्ड्

३। चिन्त्

४। ज्वल्

५। लृट् लकारः (भविष्यत्कालः)

नूतन-क्रियापदानि (अधिकम्)

५। तर्ज्

६। तर्क्

७। तप्

८। नट्

## Unit IV

१। लङ् लकार-परिचयः (भूतकालः)

१। भूतकालः नाम किम्?

भूतकालिक-क्रियापदानां परिचयः।

१। गम् (गच्छ्)

२। पा (पिब्)

४। पश्य्

२। लङ् लकार-परिचयः (भूतकालः) (अधिकम्)

५। वस्

६। पठ्

७। वद्

८। पत्

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३। बन्धु-वर्ग-नामानि

माता, जननी, पिता, जनकः, स्वसा  
भगिनी, सहोदरः, भ्राता, अनुजः, अग्रजः,  
अनुजा, अग्रजा, मातुलः, मातुलानी,  
जामाता, वधूः, वरः, मातामहः, मातामही,  
पितामहः, पितामही, पुत्रः, पुत्री, पौत्रः, पौत्री  
उपर्युक्त-पदानां वाक्येषु प्रयोगः  
अनुवाद-अभ्यासः(संस्कृतात् आङ्गले/तमिल्  
भाषायाम् , आङ्गलात् संस्कृते वा)

४। वाक्येषु उपयोगः

#### Unit V

१। गृहे उपयुक्तानां उपकरणानां  
नामानि

पर्यङ्कः, मञ्जूषा, तालकम्, कुञ्जिका,  
अङ्कनी, लेखनी, उत्पीठिका, आसनम्,  
गणकयन्त्रम्, दूरदर्शनम्, आकाशवाणी,  
दूरभाषणी, दीपः, विद्युत्, विद्युत्व्यजनम्,  
शीतकयन्त्रम्, शीतकपेटिका, अग्निपेटिका,  
वस्त्रम्।(अन्यानि मुख्यानि च)

२। वासरनामानि

सोमवासरः, मङ्गलवासरः, बुधवासरः,  
गुरुवासरः, शुक्रवासरः, शनिवासरः,  
भानुवासरः

३। पक्षनामानि

शुक्लपक्षः, कृष्णपक्षः

४। मास-नामानि

चैत्रः, वैशाखः, ज्येष्ठः, आषाढः, श्रावणः,  
भाद्रपदः, आश्वीनः, कार्तिकः, आग्रहायणः, पौषः,  
माघः, फाल्गुनः अथवा  
मेषः, ऋषभः, मिथुनः, कटकः, सिंहः,  
कन्या, तुला, वृश्चिकः, धनुः, मकरः, कुम्भः,  
मीनः ।

५। तिथिनामानि

प्रथमा, द्वितीया, तृतीया, चतुर्थी, पञ्चमी,  
षष्ठी, सप्तमी, अष्टमी, नवमी, दशमी,  
एकादशी, द्वादशी, त्रयोदशी, चतुर्दशी,  
अमावास्या (अमाः), पूर्णिमा (पौर्णमी)

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७। नवग्रहनामानि

सूर्य, चन्द्रः, कुजः, बुधः, गुरुः, शुक्रः, शनैश्वरः,  
राहुः, केतुः

८। संख्या-वाचकपदानि

षड्विंशतिः आरभ्य पञ्चाशत् पर्यन्तम्।(२६-५०)

Prescribed Book:

सरलसंस्कृतशिक्षकः भागः २, भारतीयविद्याभवनम्, कुलपतिःमुन्शी मार्गः, मुम्बई, ४००००७

Reference:

1. Samskrit for Beginners, Dr M. Narasimhachari & Dr S. Ramaratnam, N&R Publications, Mylapore, Chennai 60004.
2. संस्कृत-व्यवहारसाहस्री, संस्कृत-भारती, माता मन्दिर् गली, झन्डेवाला, नव देहली ११००५५।

Subject Code: U16S4

National College (Autonomous) Tiruchirapalli

Language Course Part I Sanskrit Semester III

Paper IV - Sanskrit IV

(For the candidates admitted from the academic year June 2016 onwards)

Syllabus

Time: 3 Hours

Maximum Marks: 75

Unit I

१। कर्तृपदानि, क्रियापदानि च  
पुनश्चर्या

लट् लकारे, लृट् लकारे, लङ् लकारे च  
पूर्वस्मिन् षाण्मासत्रये अभ्यस्तानां कर्तृपदानां  
क्रियापदानां च पुनश्चर्या।

२। शब्दाः (कर्तृपद-परिचयः)

१। उकारान्तः पुल्लिङ्गः गुरु शब्दः  
केचन समानान्त-शब्दाः च।

एकवचनम् तथा बहुवचनम् केवलम्।

पशुः, मनुः, साधुः, शिशुः, प्रमुः इत्यदि शब्दाः

२। उकारान्तः स्त्रीलिङ्गः धेनु शब्दः

एकवचनम्, तथा बहुवचनम् केवलम्।

३। सर्वनामशब्दः -

दकारान्तः नपुंसकलिङ्गः तद् शब्दः

दकारान्तः पुल्लिङ्गः एतद् शब्दः

एकवचनम्, तथा बहुवचनम् केवलम्।

४। उपर्युक्त-कर्तृपदानां कर्मपदानां च वाक्येषु  
उपयोगः

५। अनुवाद-अभ्यासः (संस्कृतात् आङ्गले/तमिल्  
भाषायाम्, तथा आङ्गलात् संस्कृते च)

Unit II

क्रियापदानि

१। लट्/लृट् लकारौ  
नूतनक्रियापदानि

१। अञ्च्

२। दल्

३। नन्द्

४। यच्छ्

२। लट्/लृट् लकारौ  
नूतनक्रियापदानि

५। धृ (धरति)

६। धृ (धारयति)

७। नद् (नदति)

८। तृ (तर)

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|                                      |   |
|--------------------------------------|---|
| ३। लट्/लृट् लकारौ नूतनक्रियापदानि    | ९। नश्<br>१०। निन्द्<br>११। पीङ्<br>१२। पोष्  |
| ४। शरीर-अङ्ग-नामानि                  | शिरः, केशः, कर्णः, नासिका, नयनम्, मुखम्,<br>दन्तः, ग्रीवा, कण्ठः, उरः, स्कन्धः, करः, बाहुः,<br>हस्तः, अङ्गुली, नखः, स्मश्रुः, शिखा, उदरः,<br>कटिः, जानुः, पादौ, अस्थि, मांसं, रुधिरः, मेघः। |
| ५। प्रतिदिनं-उपयुक्तानि वस्तु नामानि | वस्त्रम्, निघोलः, ऊरुकम्, उष्णीषः, उपनेत्रम्,<br>दण्डः, पादरक्षा, घटी, द्विचक्रिका, त्रिचक्रिका,<br>कार्-यानम्, लोकयानम्, आकाशविमानम्,<br>रेल्-यानम्  |
| Unit III                             |   |
| १। पर्यटन-स्थल-नामानि                | १। धर्म-सम्बन्धीनि स्थलानि<br>२। आह्लादकर-संबन्धीनि स्थलानि<br>३। देशस्य चरित्र-चारित्र-संबन्धीनि स्थलानि<br>४। अन्वेषण-संबन्धीनि स्थलानि<br>५। विदेश-यात्रा                                |
| २। प्रतिदिनं गमनीयानि स्थलानि        | देवालयः, कार्यालयः, विद्यालयः, धनकोषः,<br>पुस्तकालयः, आपणः, चलनचित्रशाला,<br>नाट्यशाला, महाविद्यालयः, विश्वविद्यालयः,<br>मित्रगृहम्, स्नानगृहम्, शौचालयः, सुविद्यालयः,                      |
| Unit IV                              |   |
| १। रचनालेखनम्                        | रचना-लेखन-प्रकारः<br>उपोद्घातः, रचना, समापनम् - विधयः<br>दश-वाक्येषु पर्यटनस्थानमेकमधिकृत्य लेखनम्<br>पत्रम् नाम किम्?  |
| २। पत्रलेखनम्                        | पत्रलेखन-प्रकारः<br>पत्रलेखने उपयुक्ताः रीतयः<br>पत्र-आरम्भः, शरीरम्, समापनम्   |

३। पत्रलेखनम् (वैचित्र्यम्)

४। अनुच्छेद-अभ्यासः

#### Unit V

१। नूतन-कर्तृपदानि

२। व्यवहार-पदानि/वाक्यानि

३। कर्मकाराः

३। व्याकरणम्

3

१। मित्राय पत्रम्।

२। विद्यालयाय विरामपत्रम्।

३। जनकाय पत्रम्।

१। कथा-युक्तम् अनुच्छेदं पठित्वा  
उत्तर-लेखनम्।

२। वार्ता-संबन्धि-लेख-युक्तम् अनुच्छेदं  
पठित्वा उत्तर-लेखनम्।

मृगवर्गः - सिंहः, व्याघ्रः, भल्लुकः,

शृगालः, मूषकः, आखुः, सारमेयः, कुक्कुरः,  
बिडालः, वानरः, उष्ट्रः, अश्वः, गजः, वृषभः,

अजः, मेषः, वराहः, धेनुः, गौः, महिषः, बत्सः,  
हरिणः, शशकः

पक्षिवर्गः - काकः, कुक्कुटः, मयूरः, टिट्ठिमः,  
गरुडः, शुकः, कपोतः,

जलचराः - मीनः, मत्स्यः, कूर्मः, तिमिङ्गलः,  
शिष्टाचारः, मित्राणि, प्रयाणम्, छात्राः, परीक्षा,

शिक्षकः, महिला, वेश-भूषा, कार्यालयः,

आरोग्यम्, वाणिज्यम्, वातावरणम्, भोजनम्,

शुभाशयाः, संकीर्ण-पदानि।

घटकारः, कुविन्दः/तन्तुवायः, अयस्कारः,

सुवर्णकारः, रजकः, आपणिकः, बणिजः,

चर्मकारः, नापितः, संवाहकः, शाकटिकः, आरक्षकः

गोपालकः, अश्वपालकः, अजपालकः, पुरोहितः,

सन्धिप्रकरणम् -

प्रभेदाः - स्वरसन्धिः, व्यञ्जन-सन्धिः

विसर्गसन्धिः

स्वरे - सवर्णदीर्घः, गुणः, यण्, वृद्धिः,

अयवायावः, प्रकृतिभावः

#### Prescribed Books:

1. सरलसंस्कृतशिक्षकः, भागः २, भारतीयविद्याभवनम्, कुलपति मुन्शी मार्गः, मुम्बई ४००००७।

2. संस्कृत-व्यवहार-साहस्री 3. सन्देशसंस्कृतम्, -संस्कृतभारती, माता मन्दिर गली, झण्डेवाला, नव देहली ११००५५

#### Reference:

1. Samskrit for Beginners, Dr M. Narasimhachari and Dr S. Ramaratnam, N & R  
Publications, Mylapore, Chennai 600004.

**ENGLISH FOR COMMUNICATION – U16E1****Semester: I****English Language Course I****Instruction Hours/Week: 6****Credit: 3**

- UNIT I:**
1. At the College
  2. On the Campus
  3. Outside the Class
  4. At the Post office
  5. For Business and Pleasure
  6. Review

- UNIT II:**
7. Are you Smart ?
  8. Are You Creative?
  9. Is it too hard to improve?
  10. How to win ?
  11. View Points
  12. Snakes and Ladders
  13. Yourself

- UNIT III:**
1. Birbal story- The loyal gardener
  2. Hindu mythological story- The origin of coconut tree
  3. Achinese story: The generous student
  4. An Africal Story ; The Three Runners

**UNIT IV:**

5. The Golden place
6. The one – hundreth prince
7. The mouse Merchand

- UNIT V:**
8. When wishes come true – Rabindranath Tagore
  9. The World and after
  10. Julius caesar

**Text Books:** 1. Crystal Streams – A Prose collection by D.E. Benet. Published by New Century Book House (P) Ltd.

2. Creative English for Communication (2nd edition) by Krishnasamy and Sriraman. Published by Macmillan



**ENGLISH THROUGH EXTENSIVE READING – U16E2**

**SEMESTER : II**

**ENGLISH LANGUAGE COURSE : II**

**INSTRUCTION HOURS/WEEK : 4**

**CREDIT : 2**

**UNIT I**

|               |   |                 |       |
|---------------|---|-----------------|-------|
| Excitement    | : | Mack R. Douglas |       |
| Tight Corners | : | E.V.            | Lucas |

**UNIT II**

|                            |   |                    |
|----------------------------|---|--------------------|
| Water – The Elixir of Life | : | C.V. Raman         |
| Tree Speaks                | : | C. Rajagopalachari |

**UNIT III**

|                          |   |              |
|--------------------------|---|--------------|
| The Art of Telling Tales | : | April Hersey |
| A Job Well Done          | : | Ruskin Bond  |

**UNIT IV**

|                              |   |                         |
|------------------------------|---|-------------------------|
| The Panorama of India's Past | : | Jawaharlal Nehru        |
| The Origin of Grammar        | : | Margaret Bryant & Janet |

**UNIT V**

|                       |   |                 |
|-----------------------|---|-----------------|
| Dangers of Drug Abuse | : | Hardin B. Jones |
| Crime and Punishment  | : | R.K. Narayan    |

**Text Book :** Dr. Ananthan , R. Effective Communication. Ed. Chennai : Anu Chithra Pub.2010.

**COMMUNICATIVE ENGLISH I – U16CE1****Semester : II****Communicative English Course : I****Instruction Hours/ Week : 2****Credit : 1****UNIT I**

Writing Stories

Grammar Components : Articles, Prepositions and Tenses

**UNIT II**

Precis Writing

Grammar Components : Non- Finite Verbs and Phrasal Verbs

**UNIT III**

Writing Letters

Grammar Components : Conjunctions and Interjections and Punctuation

**UNIT IV**

Reporting

Grammar Components : Reported Speech and Transformation of Sentences

**UNIT V**

Writing an Essay

Grammar Components : Sentence structure (S/V/O/C/A) and Simple, Compound and Complex sentences

**Text book :** Pillai, Radhakrishna G. English Grammar & Composition Ed. Chennai : Emerald Pub.2016

**ENGLISH FOR COMPETITIVE EXAMINATIONS – U16E3****SEMESTER : III****INSTRUCTION HOURS/WEEK : 6****ENGLISH LANGUAGE COURSE : III****CREDIT : 3****UNIT I:**

Basics of English( Revision)

(a)Parts of speech and Articles

(b)Active and passive voice

(c)Framing Questions

(d)Tag questions

(e)Indirect speech

(f)Tenses

**UNIT II:**

(a)Errors and how to avoid them

(b)Spotting errors

(c)Reconstructing passages

(d)Précis writing

**UNIT III:**

Reading comprehension

**UNIT IV:**

(a)Sentence completion,

(b) Spelling

(c)Vocabulary – Words often confused or Misused, Synonyms, Antonyms.

**UNIT V:**

Letter writing , Report writing ,Paragraph writing, Essay writing

**Text book : English for Competitive Examinations by R.P.Bhatnagar&Rajul Bhargava macmillanIndia Ltd. Delhi.**

**COMMUNICATIVE ENGLISH II – U16CE2**

**SEMESTER : IV**

**COMMUNICATIVE ENGLISH COURSE : II**

**INSTRUCTION HOURS/WEEK : 2**

**CREDIT : 1**

**UNIT I:**

Enriching Vocabulary – Register Development; who is who; Synonyms, Proverbs

**UNIT II:**

Tense Forms with emphasis on differences between Present and Present Continuous; Past and Present Perfect , Framing questions, Auxiliaries, if clauses; conjunctions and linkers; Prepositions

**UNIT III**

Pronunciation, Good Pronunciation habits, Phonetic Transcription, Greetings, Farewells commands etc.,

**UNIT IV:**

Conversational Skills – Affirmative or Negative Language – idiomatic expressions, Phrases, Dialogue Writing,

**UNIT V:**

- Writing Skills – Note- taking, note- making, e-mail, Describing an object, narrating a story.
- Circulars
- Notes - reminders, warnings, farewells, apology.
- Draft invitations – marriage, annual day, inaugural functions of associations, valediction, seminar, workshop.
- Draft Short messages- compliments, birthday wishes, notifications
- Draft Posters- Slogans, Announcements
- Draft Advertisements
- Dialogue writing

**Text Book**

1. Communicative English by Department of English, National College( Autonomous), Trichy

**READING POETRY AND DRAMA – U16E4**

**SEMESTER : IV**

**INSTRUCTION HOURS/WEEK : 6**

**POETRY:**

**UNIT I :** John Milton

Oliver Goldsmith

William Wordsworth

**ENGLISH LANGUAGE COURSE : IV**

**CREDIT : 2**

: On His Blindness

: The Village School Master

: The Solitary Reaper

**UNIT II :** P.B.Shelly

John Keats

Robert Browning

: Ozymandias

: La Belle Dame Sans Merci

: Incident of the French camp

**UNIT III :** John Masefield

Robert Frost

Evening

John Drinkwater

: Laugh and Be Merry

: Stopping by Woods On a Snowy

: The Vagabond

**DRAMA:**

**UNIT IV:** Anton Chekov

Lady Gregory

: A Marriage Proposal

: The Rising of the Moon

**UNIT V:** W.St. John Tayleur

William Shakespeare

Venice – Act V

: Reunion

: Othello, The Moor of

**Text Books :** 1)**An Introduction to Poetry** edited by A.G.Xavier; [Macmillan]

2)**A Book Plays:** A Group of Editors, Published by Orient Blackswan

## ALGAE AND BRYOPHYTES – U16BO1

**Semester : I**  
**Instruction Hours/Week : 5**

**Core Course: I**  
**Credit : 5**

**UNIT-I** (Teaching-1 h / week)

**Algae:** General characteristics of Cyanophyceae, Chlorophyceae, Phaeophyceae, and Rhodophyceae. Classification of algae by G. M. Smith (1955). Habit and habitats of Fresh Water, Marine and Soil algae. Economic importance of algae.

**UNIT-II** (Teaching-1 h / week)

Vegetative forms, cell structure, pigmentation, food reserves, life cycle of *Oscillatoria*, *Volvox*, *Oedogonium* and *Caulerpa*.

**UNIT-III** (Teaching-1 h / week)

Thallus organization, Cell structure and Life cycle of *Ectocarpus*, *Dictyota*, and *Polysiphonia*.

**UNIT-IV** (Teaching-1 h / week)

**Bryophytes:** General characteristics of Hepaticopsida, Anthocerotopsida and Musci. An outline of Classification of Bryophytes. Economic importance of bryophytes.

**UNIT-V** (Teaching-1 h / week)

Structure, reproduction and life cycle of *Marchantia*, *Anthoceros* and *Polytrichum*.

### REFERENCES

#### Algae

- Bold, H. C. and Wynne, M. J. (1978). Introduction of Algae - Structure and Reproduction. Prentice Hall of India, New Delhi.
- Chapman, V. J. and Chapman, D. J. (1973). The Algae. 2nd ed. Macmillan, London.
- Fritsch, F. E. (1945). The Structure and Reproduction of the Algae. Vol. I & II. Cambridge University Press, London.
- Kumar, H. D. and Singh, H. N. (1976). A Textbook of Algae. East-West Press Pvt. Ltd., New Delhi.
- Kumar, H. D. (1990). Introduction to Phycology. East-West Press Pvt. Ltd., New Delhi.
- Round, F. E. (1973). Biology of the Algae. 2nd Edition. Edward Arnold Press, London.
- Sharma, O. P. (1990). Textbook of Algae. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Smith, G. M. (1955). Cryptogamic Botany. Vol. I. McGraw Hill, New York.
- Vashishta, B. R. (1988). Botany for Degree Students (Algae). S. Chand and Co. Ltd., New Delhi.
- Venkateswarlu, V. (1970). A Textbook of Algal Maruti Book Depot, Gunter, Hyderabad.

**Bryophytes**

- Cavers Frank. (1911) The Interrelationship of Bryophytes. New Phytologist, Indian Reprint.
  - Chopra, R. N. and Kumara, P. K. (1988). Biology of Bryophytes. Wiley Eastern Ltd., New Delhi.
  - Dublish, P. K. and Agarwal, D. K. (1973). A Textbook of Bryophyta, rajeeva Prakashan, Meerut, India.
  - Parihar, N. S. (1972). An Introduction to Embryophyta. Vol.II: Bryophyta. Central Book Depot, Allahabad.
  - Rashid, A. (1998). An Introduction to Bryophyta. Vikas Publishing House Pvt. Ltd., New Delhi.
  - Smith, G. M. (1955). Cryptogamic Botany. Vol. II. (Bryophytes and Pteridophytes), (2nd ed). Tata McGraw Hill, New Delhi.
  - Vashishta, B. R. (1983). Botany for Degree Students: Bryophyta. S. Chand and Co. Ltd., New Delhi.
  - Watson, E. V. (1968). British Mosses and Liverworts. Cambridge University Press, London.
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**CORE COURSE II - U16BO2P  
PRACTICAL I (Pertaining to BO1 & BO3)**

**Semester : I  
Instruction Hours/Week : 3**

**Core Course : II  
Credit :**

**Practical-I (CCBO1)**

**Algae:**

*Oscillatoria, Volvox, Oedogonium, Caulerpa, Ectocarpus, Dictyota, and Polysiphonia*

**Bryophytes:**

*Marchantia, Anthoceros and Polytrichum.*

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## FUNGI, LICHEN, PLANT PATHOLOGY AND PLANT PROTECTION- U16BO3

**Semester : II**  
**Instruction Hours/Week : 5**

**Core Course: III**  
**Credit : 5**

### UNIT-I (Teaching-1 h / week)

**Fungi:** General characteristics and mode of life of Phycomycetes, Ascomycetes, Basidiomycetes and Deuteromycetes. Classification of Fungi by C. J. Alexopoulos (1962) Economic Importance of Fungi.

### UNIT-II (Teaching-1 h / week)

Structure, reproduction and life cycle of *Aspergillus*, *Peziza.*, *Puccinia*, *Polyporus*.

### UNIT-III (Teaching-1 h / week)

Lichen: Occurrence, classification and types of lichens. Morphology, anatomy and reproduction of *Usnea*. Economic importance of lichens.

### UNIT-IV (Teaching-1 h / week)

**Plant Pathology:** Mycoplasma - Little leaf of brinjal. Virus - Tobacco Mosaic Virus. Bacteria - Citrus canker. Fungus: Red rot of sugarcane - Tikka disease of Groundnut and Blast disease of paddy.

### UNIT-V (Teaching-1 h / week)

**Plant Protection:** Methods of protection - Cultural, Physical, Chemical and Biological controls – Integrated Pest Management (IPM). Forms and methods of application of Fungicides and Pesticides - hazards of pesticide application. Plant protection appliances - Seed protection.

## References

### Fungi

- Alexopoulos, C. J., Mims, C. W. and Blackwell, M. (1996). Introductory Mycology. John Wiley & Sons Inc., New York.
- Bold, H. C., Alexopoulos, C. J. and Delavoryas, T. (1987). Morphology of Plants and Fungi. Harper & Row Publishers, New York.
- Burnett, J. H. (1968). Fundamentals of Mycology. Edward Arnold (Publishers) Ltd., London.
- David H. Griffin (1994). Fungal Physiology. Wiley-Liss Inc. New York.
- Elizabeth Moore - Landecker (1972). Fundamentals of the Fungi. Prentice Hall Inc., New Jersey, USA.

- Gangulee, H.C. and Kar, A.K. (1989). College Botany, Vol II. New Central Book Agencies Ltd., Kolkata
- Ingold, C. T. (1976). The Biology of Fungi. Hutchinson, London
- Karl Esser (1982). Cryptogams: Cyanobacteria, Algae, Fungi, Lichens: Text Book and Practical Guide/ University of Cambridge, New York.
- Mehrotra, R. S. and Aneja, K. R. (1990). An Introduction to Mycology. Wiley Eastern Ltd., New Delhi.
- Pandey, S.N. and Trivedi, P.S. (). A Text Book of Botany, 11<sup>th</sup> Edition. Vikas Publishing House, New Delhi.
- Rajni Gupta (2004). A Text Book of Fungi. APH Publishing Corporation, New Delhi
- Sharma, O.P. (1989). Text Book of Fungi. Tata McGraw Hill Pvt. Ltd., New Delhi.
- Vashista, B. R. (1982). Botany for Degree Students - Fungi. S. Chand & Co., New Delhi.
- Webster, J. (1999). Introduction to Fungi. 2nd ed. Cambridge University Press.

### **Lichens**

- Kershew, K.A. (1985). Physiological Ecology of Lichens. Cambridge University Press, New York
- Nash, T.H. (1996). Lichen Biology. Cambridge University Press, London.

### **Plant Pathology**

- Bilgrami, K. S. and Dube, H. C. (1990). A Textbook of Plant Pathology. Vikas Publishing House Pvt. Ltd., New Delhi.
- Govindaswamy, C. V. and Alagiamagalingam, M. N. (1981). Plant Pathology. Popular Book Depot, Chennai.

**PTERIDOPHYTES, GYMNOSPERMS AND PALEOBOTANY- U16B04**

**Semester : III**  
**Instruction Hours/Week :4**

**Core Course : IV**  
**Credit : 4**

**UNIT-I**

Pteridophytes - General characteristics Pteridophytes – Salient features of Psilophyta, Lycophyta and Sphenophyta. Classification of pteridophytes by Smith - External and Internal features, reproduction and life-cycle of *Psilotum*, *Lycopodium*, *Selaginella* and *Equisetum*.

**UNIT-II**

External and internal features, reproduction and life-cycle of *Adiantum*, *Gleichenia* and *Marsilea*. Stellar evolution in Pteridophytes. Heterospory and origin of seed habit.

**UNIT-III**

Gymnosperms - General characteristics of Gymnosperms – Salient features of Cycadopsida, Coniferopsida and Gnetopsida. Classification of Gymnosperms by K. R. Sporne (1965) - External and internal structure, mode of reproduction and life-cycles of *Cycas*, *Pinus* and *Gnetum*. Economic importance of gymnosperms

**UNIT-IV**

Paleobotany - Fossils - types of fossils and methods of fossilization - Geological time-scale - Age of fossils - Radio-Carbon Dating – Uses of fossils.

**UNIT-V**

Study of the fossil forms - *Rhynia*, *Lepidodendron* *Calamites* and *Williamsonia*.

**Units 1 & 2 - Teaching- 2 hrs / week; Unit 3 - Teaching- 1 h / week;**  
**Units 4 & 5 - Teaching- 1 h / week;**

**References**

**Pteridophytes**

- Eames, A. J. (1936). Morphology of Vascular Plants (Lower Groups). McGraw Hill, New York.
- Parihar, N. S. (1999). An Introduction to Embryophyta. Vol. II. Pteridophyta. Central Book Depot, Allahabad.
- Smith, G. M. (1955). Cryptogamic Botany. Vol. II (2nd ed). (Bryophytes and Pteridophytes). Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Sporne, K. R. (1970). The Morphology of Pteridophytes (The structure of Ferns and Allied Plants). Hutchinson University Library, London.
- Bierhorst, D. W.(1971). Morphology of Vascular Plants. The MacMillan Co., New York, London.
- Sharma, O. P. (1990). Textbook of Pteridophytes. MacMillan India Ltd., Delhi.
- Sundara Rajan, S. (1994). Introduction to Pteridophyta. New Age International Publishers Ltd., New Delhi.
- Vashista, P. C. (1997). Botany for Degree Students - Pteridophyta. S. Chand & Co. Ltd., New Delhi.
- Rashhed, A. (1999). An Introduction to Pteridophyta. Vikas Publishing Co., New Delhi.

**Gymnosperms**

- Couulter, J. M. and Chamberlain, C. J. (1964). Morphology of Gymnosperms. Central Book Depot, Allahabad.
- Sporne, K. R. (1971). The Morphology of Gymnosperms (The Structure and Evolution of Primitive Seed Plants). Hutchinson University Library, London.
- Datta, S. C. (1984). An introduction to Gymnosperms. Kalyani Publishers, New Delhi.
- Chopra, G. W. and Verma, Y. (1988). Gymnosperms. Pradeep Publications, Jalandhar.
- Vashista, P. C. (1996). Botany for Degree Students - Gymnosperms (2nd ed). S. Chand & Co. Ltd., New Delhi.
- Sharma, O. P. (1997). Gymnosperms. Pragati Prakashan, Meerut, India.
- Bhatnagar, S. P. and Alok Moitra (1997). Gymnosperms. New Age International (P) (Ltd.) Publisher, New Delhi.
- Srivastava, H. N. (1998). Gymnosperms. Pradeep Publications, Jalandhar, India.

**Paleobotany**

- Arnold, C. A. (1947). An Introduction to Paleobotany. McGraw Hill, New York.
  - Seward, A. C. (1959). Plant Life Through the Ages. Hafner Publishing Co., New York.
  - Scott, D. H. (1962). Studies in Fossil Botany. (Vol. I and II). Hafner Publishing Co., New York.
  - Delavoryas, T. (1962). Morphology and evolution of Fossil Plants. Holt, Rinehart & Winston, New York.
  - Shukla, A. C. and Misra, S. P. (1975). Essentials of Paleobotany. Vikas Publishing House (P) Ltd., Delhi.
  - Stewart, W. N. (1983). Paleobotany and the Evolution of Plants. Cambridge University Press, London.
  - Venkatachala, B. S., Shukla, M. and Sharma, M. (1992). Plant Fossils: A link with the past (A Birbal Sahni Birth Centenary Tribute) Birbal Sahni Institute of Paleobotany, Lucknow, India.
-

**CORE COURSE V - U16BO5P  
PRACTICAL II (Pertaining to BO4 & BO 6 )**

**Semester : III & IV  
Instruction Hours/Week:3**

**Core Course: V  
Credit : 5**

**Pteridophyta:**

*Psilotum, Lycopodium, Selaginella, Equisetum, Adiantum, Gleichenia and Marsilea*

**Gymnosperms:**

*Cycas, Pinus and Gnetum*

**Paleobotany:**

Fossils - *Rhynia, Lepidodendron, Calamites and Williamsonia* (spotters only)

**PLANT DIVERSITY, TAXONOMY, ANATOMY, EMBRYOLOGY, MICROBIOLOGY  
AND PLANT PATHOLOGY - U16ABO1**

**Semester : III**  
**Instruction Hours/Week : 4**

**Second Allied Course : I**  
**Credit : 3**

**UNIT-I** (Teaching-1 h / week)

General characteristics and economic importance Algae, Fungi, Bryophytes, Pteridophytes and Gymnosperms. Brief account on *Volvox* (Alga), *Polyporus* (Fungus), *Anthoceros* (Bryophyte), *Lycopodium* (Pteridophyte) and *Pinus* (Gymnosperm).

**UNIT-II** (Teaching-1 h / week)

Angiosperm – Diagnostic features. Flower - Floral parts and their functions. Classification of angiosperms - Bentham and Hooker's system.

Characteristic features and economic importance of Annonaceae, Fabaceae, Asteraceae, Solanaceae, Euphorbiaceae and Poaceae. .

**UNIT-III**

Tissue system – Meristem - Parenchyma, Collenchyma, Chlorenchyma, Xylem and Phloem - Anatomical structure of root and stem in dicots and monocots - Secondary thickening of Dicot stem

**UNIT-IV** (Teaching-1 h / week)

Structure of mature anther, Ovule and embryo sac. Double fertilization. Development of Dicot embryo.

**UNIT-V** (Teaching-1 h / week)

Bacteria: Cell Structure, morphological types and reproduction. Plant viruses - TMV Structure. Bacterial disease of plants: Citrus canker. Viral disease of plants: Bunchy top of Banana. Fungal disease of plants: Cotton wilt. Control of plant diseases

Unit-1: 1 h / week; Unit-2: 1 h / week; Units-3&4: 1 h / week; Unit-5: 1 h / week;

**References**

- A. K. Ganguly (1971). General Botany - Vol. I. The New Book Stall, Calcutta.
- K. N. Rao, K. V. Krishnamurthy and G. Rao (1979). Ancillary Botany. Viswanathan Pvt. Ltd.
- N. Kumar (1999). Introduction to Horticulture. Rajalakshmi Publication, Nagercoil.
- B. P. Pandey (1992). A Textbook of Plant Pathology, Pathogen and Plant Disease. S. Chand & Co. Ltd., New Delhi.

**Allied Botany: PRACTICAL  
(Covering Allied Courses I & II)  
Allied Botany (U16ABO2P)**

**Semester : III  
Instruction Hours/Week : 3**

**Second Allied Course : II  
Credit : 3**

1. To describe plants in technical terms and to identify the family based on morphological and floral characteristics
  2. To dissect out median longitudinal section of a flower, construct the floral diagrams and describe it in terms of floral formula.
  3. To make suitable anatomical preparation of dicot and monocot stem .
  4. To identify disease of infected plant materials (Citrus canker)
  5. To identify the cell organelles from the photograph
  6. To find out monohybrid and dihybrid crosses and ratios from the genetic chart (3:1, 9:3:3:1 and 2:1)
  7. To critically comment on the simple experimental set-ups in photosynthesis and respiration.
  8. To critically comment on tissue culture experimental set up (Callus and multiple shoots).
  9. To study adaptations in:
    - Hydrophytes (eg.: *Hydrilla*)
    - Xerophytes (eg.: *Nerium*)
    - Halophytes (Spotter only)
-

**CORE COURSE VI ANATOMY AND EMBRYOLOGY - U16B06**

**Semester : IV**  
**Instruction Hours/Week : 4**

**Core Course : VI**  
**Credit : 4**

**UNIT-I**

Anatomy — Meristem- Characteristics, Classification of meristem – apical, lateral and intercalary. Shoot apex- theories of shoot apex - . Root apex – theories of root apex - .Meristematic Tissues - classification of meristems, shoot apical meristems, theories on shoot apical meristem (apical cell theory, histogen theory, and tunica corpus theory)- root apical meristem and root apical meristem theories ( Apical cell theory, Histogen theory, Korper-Kappe theory and Quiscent Centre theory).

**UNIT-II**

Classification of plant tissues – simple permanent tissues – structure and function of parenchyma, collenchyma and sclerenchyma. Complex Permanent Tissues - Components, structure and functions of Xylem and Phloem. Epidermal Tissues – stomata types – laticifers

**UNIT-III**

Primary structure of root, stem and leaf in dicot and monocot. Normal Secondary growth in stem and root - heartwood, sapwood - annual rings – hard wood and soft wood - Periderm formation. Anomalous secondary growth in dicot stems (*Nyctanthus* and *Boerhaavia*) and monocot stem (*Dracaena*). Nodal anatomy – unilacunar, trilacunar and multilacunar types

**UNIT IV**

Part of a Flower, Microsporangium, microsporogenesis, Male gametophyte, Megasporangium, Megasporeogenesis , Female gametophyte.

**UNIT-V**

Fertilization – Double Fertilization Endosperm: types – Nuclear, cellular, Helobial and Ruminate types – Embryo - Development of dicot monocot ( Capsella) and embryo (Luzula)

**Unit - 1 – Teaching- 1 h / week; Unit - 2 - Teaching- 1 h / week;**  
**Units - 3 & 4 - Teaching- 1 h / week; Unit - 5 - Teaching- 1 h / week;**

**References**

- Foster, A. S. (1960). Practical Plant Anatomy. Van Nostrand & East-West Press, New Delhi.
- Esau, K. (1965). Vascular Differentiation in Plants. Holt, Rinehart & Winston, New York.
- Vasishta, P. C. (1977). A Textbook of Plant Anatomy. S. Nagin & Co., Jullunder.
- Cutter, E. G. (1978). Plant Anatomy Part-I: Cells & Tissues; Plant Anatomy Part-II: Experiments and Interpretations. Edward Arnold, London.



- Eames, A. J. and McDaniels, L. H. (1979). An Introduction to Plant Anatomy. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Esau, K. (1980). Plant Anatomy (2nd ed). Wiley Eastern Ltd., New Delhi.
- Krishnamurthy, K. V. (1980). Wood. Tetrahedron Publications, Tiruchirappalli.
- Govindarajulu, A. (1980). *Marangal* (Trees) (in Tamil). Tamil Nadu Textbook Society, Chennai, India.
- Singh, V., Pandey, P. C., and Jain, D. K. (1987). Anatomy of Seed Plants. Rastogi and Co., Meerut.
- Pandey, B. P. (1989). Plant Anatomy. S. Chand & Co. Ltd., New Delhi.
- Fahn, A. (1997). Plant Anatomy. Pergamon Press, Oxford.
- Esau, K. (1965). Anatomy of Seed Plants. John Wiley & Sons, New York.

### **Embryology**

- Maheswari, P. (1963). Recent Advances in the Embryology of Angiosperms. International Society of Plant Morphologists. University of Delhi.
  - Jha, B. (1972). Life History and Embryology of Angiosperms. Pragati Prakashan, Meerut, India.
  - Swamy, B. G. L. and Krishnamoorthy, K. V. (1980). From Flower to Fruit. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
  - Johri, B. M. (1982). Experimental Embryology of Vascular Plants. Springer-Verlag, Heidelberg.
  - Verghese, T. M. (1984). An Introduction to Experimental and Applied Embryology of Angiosperms. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
  - Maheswari, P. (1985). An Introduction to the Embryology of Angiosperms. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
  - Raghavan, V. (1986). Embryogenesis in Angiosperms (A Developmental and Experimental Study). Cambridge University Press, London.
  - Dwivedi, J. N. (1988). Embryology of Angiosperms. Rastogi and Co., Meerut..
  - Muneeswaran, A. (1990). Angiosperms Embryology. Titan Books, Madurai.
  - Bhojwani, S. S. and Bhatnagar, S. P. (2000). The Embryology of Angiosperms (4th ed). Vikas Publishing House (P) Ltd., Delhi.
  - Annie Regland (2000). Developmental Botany (Embryology of Angiosperms). Saras Publicaitons, Nagercoil, Tamil Nadu, India.
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## Non-Major Elective

### HORTICULTURE - U16NMBO1

**Semester : IV**  
**Instruction Hours/Week : 2**

**Major Elective-I**  
**Credit : 2**

#### **UNIT-I**

Horticulture - Importance and scope of Horticulture - Classification of horticultural crops - Factors affecting horticultural crops- climatic, soil and nutritional;

#### **UNIT-II**

Conventional plant propagation methods - cutting, layering, grafting and budding.  
Modern plant propagation method: Micropropagation

#### **UNIT-III**

Garden designs. Garden types – Ornamental, Kitchen, indoor gardens Lawn making.  
Floriculture - cultivation of commercial flowers – Roses and Jasmines.

#### **UNIT-IV**

cultivation methods of Brinjal  
Pomology: Cultivation of fruit trees – Mango.

#### **UNIT-V**

Application of Horticulture: Bonsai – Cut flowers - Preservation of vegetables and fruits

**Units 1,2 & 3 : Teaching - 1 h / week**  
**Unit 4 & 5 : Teaching - 1 h / week;**

#### **References**

- Bose, T. K. and Mukherjee, D. (1972). Gardening in India. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi
- Sandhu, M. K. (1989). Plant Propagation. Wiley Eastern Ltd., New Delhi.
- Lex Lauries & Victor H. Rice (1950). Floriculture: Fundamental and Practices. McGraw Hill, New York.
- Kumar, N. (1997). Introduction to Horticulture. Rajalakshmi Publications, Nagercoil
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- Edmond Musser and Andres. Fundamentals of Horticulture. McGraw Hill, New York.
- Gardener. Basic Horticulture. MacMillan, New York.
- Randhawa.. Ornamental Horticulture in India. Today & Tomorrow Publishers, New Delhi.
- Sundararajan, J. S., Muthuswamy, J., Shanmugavelu, K. G. and Balakrishnan, R.: A Guide to Horticulture. Thiruvankadam Printers, Coimbatore.
- Sheela, V.L (2011). Horticulture. MJP Publication, Chennai.

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**CYTOLOGY, GENETICS, EVOLUTION, PLANT PHYSIOLOGY, ECOLOGY,  
AND BIOTECHNOLOGY - U16ABO3**

**Semester : IV**  
**Instruction Hours/Week : 5**

**Second Allied Course : II**  
**Credit : 3**

**UNIT-I** (Teaching-1 h / week)

Cytology: Cell theory. Ultrastructure of plant cell. Brief account on structure and function of cell wall, plasma membrane, chloroplast, mitochondria, ribosome, lysosome, golgi complex, endoplasmic reticulum and nucleus. Nucleic acids - DNA and RNA.  
Cell division – Amitosis, mitosis and meiosis

**UNIT-II** (Teaching-1 h / week)

Genetics: Mendel's laws. Monohybrid, Dihybrid cross. Interaction of factors- Complementary factor hypothesis. Mutation.  
Evolution: Theories of evolution – Lamarckism and Darwinism

**UNIT-III** (Teaching-1 h / week)

Physiology: Absorption of water – Mechanism of absorption of water. Transpiration — mechanism of opening and closing of stomata. Factors affecting transpiration  
Photosynthesis: Pigments - light reaction – dark reaction (Calvin cycle only). Respiration: Glycolysis - Kerb's cycle.

**UNIT-IV** (Teaching-1 h / week)

Ecology: Autecology and synecology. Ecosystem- Pond as an ecosystem. Food chain, food web and energy flow in ecosystem. Ecological factors (biotic and abiotic) and adaptation of plants- Hydrophytes (*Hydrilla*), Xerophytes (*Nerium*), Mesophytes (*Hibiscus*) and Halophytes (*Rhizophora*).

**UNIT-V** (Teaching-1 h / week)

Biotechnology: Definition and scope. Tissue culture – totipotency – tissue culture medium (composition of MS medium) and basic technique of tissue culture. Gene cloning technique. Vectors- Ti plasmid - Use of *Agrobacterium* in plant transformation.

**References**

- A. K. Ganguly (1971). General Botany - Vol. I. The New Book Stall, Calcutta.
- K. N. Rao, K. V. Krishnamurthy and G. Rao (1979). Ancillary Botany. Viswanathan Pvt. Ltd.
- P. K. Gupta. Elements of Biotechnology. Rastogi and Company.
- B. C. Suman and V. P. Sharma. Mushroom Cultivation and Uses. Agrobios (India), Jodhpur.
- A. Muneeswaran (1987). A Textbook of Botany. Sun Publications, Madurai.
- K. G. Ramawat (2000). Plant Biotechnology. S. Chand & Co. Ltd., New Delhi.

**CELL AND MOLECULAR BIOLOGY - U16B07**

**Semester : V**  
**Instruction Hours/Week :5**

**Core Course : VI**  
**Credit : 5**

**UNIT-I** (Teaching- 1h/ week)

Basic principles of microscopy. Structure of Prokaryotic and Eukaryotic cells - Ultra structure and functions of plasma membrane - Ultra structure of cell organelles - Plastids, Mitochondria, Golgibody, ER- Lysosome.

**UNIT-II** (Teaching-1 h / week)

Nucleus - Nucleolus - Structure of euchromatin and heterochromatin - Special types of chromosomes - Lamp brush chromosomes and polytene chromosomes - Mitosis, and meiosis, cell cycle.

**UNIT-III** (Teaching-1 h / week)

Nucleic acids – DNA and RNA – Differentiating features -Experimental Proof for DNA as the genetic material (Griffith Experiment) -Structure, properties (C-Value Paradox) & replication of DNA- Hershey and Chase experiment – RNA - Structure, types (rRNA, mRNA and tRNA), properties and functions

**Unit-IV** (Teaching-1 h / week)

Gene regulation in Prokaryotes (*Lac* operon concept) and Eukaryotes – Transcription, Translation, Initiation, Elongation and Termination. Gene regulation in prokaryotes and eukaryotes- Differences..

**UNIT-V** (Teaching-1 h / week)

Chloroplast and mitochondrial genome organization – Basic mechanism of signal transduction – Programmed Cell Death (PCD)

**References**

- Sharma, N. S. (2005). Molecular Cell Biology, International Book Districtors, Dehradun.
- Verma, P. S. and Agarwal, V. K. ((1986). Cell Biology and Molecular Biology (Cytology). S. Chand & Co. Ltd., New Delhi.
- Old, R. W. and Primrose, S. B. (1994). Principles of Gene Manipulation. Blackwell Science, London.
- Grierson, D. and Convey, S. N. (1989). Plant Molecular Biology. Blackie Publishers, New York.
- Lea, P. J. and Leegood, R. C. (1999). Plant Biochemistry and Molecular Biology. John Wile & Sons, London.
- Power, C. B. (1984). Cell Biology. Himalayas Publishing Co., Mumbai.
- De, Robertis and De Robertis (1998). Cell and Molecular Biology. K. M. Verghese and Co.

**MORPHOLOGY, TAXONOMY AND ECONOMIC BOTANY - U16B08**

**Semester : V**  
**Instruction Hours/Week : 5**

**Core Course : VIII**  
**Credit : 5**

**UNIT-I** (Teaching-1 h / week)

Morphology and taxonomic description of a flower and floral parts - Inflorescence - Types - racemose, cymose, mixed and special types.

Fruit - simple, fleshy, dry dehiscent and dry indehiscent.

**UNIT-II** (Teaching-1 h / week)

Binomial nomenclature – ICBN rules - taxonomic types –. Systems of Classification - Bentham and Hooker classification - Merits and demerits. Herbarium techniques.

**UNIT-III** (Teaching-1 h / week)

A detailed study of the following families with their economic importance - Annonaceae, Capparidaceae, Tiliaceae, Rutaceae, Anacardiaceae, Leguminosae (Papilionaceae, Cesalpiniaceae and Mimosaceae) and Cucurbitaceae.

**UNIT-IV** (Teaching-1 h / week)

A detailed study of the following families with their economic importance -Rubiaceae, Asteraceae, Apocynaceae, Asclepiaceae, Solanaceae, Verbenaceae, Euphorbiaceae, Orchidaceae and Poaceae.

**UNIT-V** (Teaching-1 h / week)

Economic Botany - A brief study of the following economic plants and their main economic importance products:

- i) Food - Cereals (*Oryza*, *Eleusine*), Pulses (*Phaseolus*), Edible oil (*Seasamum*), root tubers (*Manihot*), sugar (*Saccharum*).
- ii) Fibres - cotton (*Gossypium*), Jute (*Corchorus*).
- iii) Medicinal plants - *Ocimum*, *Phyllanthus*, *Rauwolfia*.
- iv) Forest products – Timber- *Tectona* (Teak), *Artocarpus* (Jack)], Tannins, Gums, Turpentine.

**References****Taxonomy**

- Lawrence, G. H. M. (1953). Taxonomy of Vascular Plants. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Mitra, J. N. (1964). An introduction to Systematic Botany and Ecology. The World Press (P) Ltd., Calcutta.
- Jefferey, C. (1968). An Introduction to Plant Taxonomy. J. A. Churchill, London.
- Mathur, R. C. (1970). Systematic Botany (Angiosperms). Agra Book Stores - Lucknow.
- Ramaswami, S. N., Lakshminarayana, S. and Venkateswaralu, V. (1976). Taxonomy (Systematic Botany) for Degree Course. Maruthi Book Depot, Hyderabad.

- Narayanaswamy, R. V. and Rao, K. N. (1976). Outlines of Botany. S. Viswanathan Printers & Publishers, Chennai.
- Singh, V. and Singh, D. K. (1983). Taxonomy of Angiosperms. Rastogi and Co., Meerut.
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- Pandey, B. P. (1997). Taxonomy of Angiosperms. S. Chand & Co. Ltd., New Delhi.
- Naik, V. N. (1996). Taxonomy of Angiosperms. (9th ed.). Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Vashista, P. C. (1997). Taxonomy of Angiosperms. S. Chand & Co. Ltd., New Delhi.
- Subramaniyan, N. S. (1999). Laboratory Manual of Plant Taxonomy. (2nd ed.). Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Jaques, H. E. (1999). Plant Families - How to know them? Agro Botanical Publishers (India), Bikaner.
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- Matthew, K. M. (1987). Flora of Tamil Nadu and Carnatic (Vol. I-V). Rapinat Herbarium, St. Joseph's College, Tiruchirappalli.
- Lawrence, G. H. M. An Introduction to Plant Taxonomy. The Central Book Depot, Allahabad.
- Sharma, O. P. Plant Taxonomy. Tata McGraw Hill Publishing Co. Ltd., New Delhi.

### **Economic Botany**

- Hill, A. W. (1952). Economic Botany. McGraw Hill, New York.
- Gupta, S. K. and Kaushik, M. P. (1973). An International to Economic Botany. K. Nath & Co., Meerut.
- Verma, V. (1974). A Textbook of Economic Botany. Emkay Publications, New Delhi.
- Govinda Prakash and Sharma, S. K. (1975). Introductory Economic Botany. Jai Prakash Nath & Co. Meerut.
- Sambamurthy, A. V. V. S. and Subramanyan, N. S. (1989). A Textbook of Economic Botany. Wiley Eastern Ltd., New Delhi.
- Sen, S. (1992). Economic Botany. New Central Book Agency, Calcutta.
- Ashok Bendre and Ashok Kumar (1998). Economic Botany. Rastogi and Co., Meerut..
- Pandey, B. P. (2000). Economic Botany. S. Chand & Co. Ltd., New Delhi.

**MICROBIOLOGY – U16BO9E**

**Semester : V**  
**Instruction Hours/Week : 5**

**Elective Course : I**  
**Credit : 4**

**UNIT-I** (Teaching-1 h / week)

History, scope and branches of microbiology. Nomenclature and outline of classification of microorganisms - R. H. Wittaker (1969) and Woose (1977)/ - Morphological and nutritional (chemoautotrophic, chemoheterotrophic, photoautotrophic and photo heterotrophic) and cultural characteristics of bacteria, viruses, protozoa, algae and fungi.

**UNIT-II** (Teaching-1 h / week)

Culture of microorganisms: Pure cultures, batch and continuous cultures. Isolation, cultivation and preservation of microorganisms. Media for bacteria; types of media – selective and enriched media.

Microbial staining techniques: Smear, wet mount hanging drop and Gram staining techniques.

**UNIT-III** (Teaching-1 h / week)

Bacteria: Morphology, size and shape and, physiology of bacteria. Structure of a typical bacterial cell. Growth and reproduction of bacteria.

Viruses: Discovery, general characteristics and origin. Bacteriophage – structure and reproduction. Virioids and prions

**UNIT-IV** (Teaching-1 h / week)

Microorganisms and diseases: Microbial pathogenicity and virulence. Factors affecting pathogenicity – toxins, extracellular enzymes and cellular factors. Agents of disease spread – air (Tuberculosis), water (Typhoid and Cholera), food (Botulism), insects (Mosquito)

Microbial production of antibiotics and chemotherapeutic agents. Source, Structure, industrial production and mode of action of penicillin

**UNIT-V** (Teaching-1 h / week)

Soil Microbiology: Rhizosphere, rhizosphere microflora and their role. (carbon, nitrogen, phosphorus and sulphur transformation)

Aquatic microbiology: Freshwater and marine microbiology. Sewage water treatment – primary, secondary and tertiary treatments. .

Food microbiology: Microbiology of milk and dairy products

**References**

- Pelczar, J., Chan, E. C. S. and Krieg, R. (1999). Microbiology. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Sullia, S. B. and Shantharam, S. (2005). General Microbiology. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Dubey, R. C. and Maheswari, D. K. (2004). A Textbook of Microbiology. S. Chand & Co. Ltd., New Delhi
- Purohit, S. S. (1997). Microbiology. Bikanar.
- Martin Alexander (1978). Introduction to Soil Microbiology. Wiley Eastern, New Delhi.
- Casida, L. E. (1989). Industrial Microbiology. Wiley Eastern, New Delhi.
- Frazier, N. C. (1974). Food Microbiology (2nd ed). Tata McGraw Hill Publishing Co. Ltd., New Delhi.

**BIOTECHNOLOGY– U16BO10E**

**Semester : V**  
**Instruction Hours/Week : 5**

**Elective Course : II**  
**Credit : 4**

**UNIT-I** (Teaching-1 h / week)

Tissue culture: History and scope. Laboratory organization. Sterilization: techniques and types. Preparation of MS medium, hormones, and their role. Callus – types and culture

**UNIT-II** (Teaching-1 h / week)

Micropropagation: Organogenesis - direct and indirect. Somatic embryogenesis. Synthetic seeds. Hardening of plants

**UNIT-III** (Teaching-1 h / week)

Genetic engineering: Basic principles. Gene cloning - Enzymes in genetic engineering (exonucleases, endonucleases) - Restriction endonuclease, DNA Ligase, reverse transcriptase and Tag polymerase

**UNIT-IV** (Teaching-1 h / week)

Gene cloning strategy: Vectors in gene cloning – Plasmids -Ti plasmid, pBR322 and cosmid. *Agrobacterium* – crown gall tumor – characteristics and formation

**UNIT-V** (Teaching-1 h / week)

Biotechnology: Prospects and Application with reference to Agriculture (*Bt* plant), Medicine (insulin production) and Industry (wine production). Limitations of Biotechnology.

**Reference**

- Dodds, J. H. and Roberts, I. W. (1985). Experiments in Plant Tissue Culture. Cambridge University Press, UK.
- Dubey, R. C. (2008). A Textbook of Biotechnology. S. Chand & Co., New Delhi
- Fowler, M. W. (1986). Industrial Application of Plant Cell Culture. In: Yeoman, M. M. (ed.). Plant Cell Culture Technology. Blackwell, Oxford, London.
- Gamborg, O. L. and Phillips, G. C. (1995). Plant Cell, Tissue and Organ Culture: A Fundamental Methods. Narosa Publishing House, New Delhi.
- Gupta, P. K. (1994). Elements of Biotechnology. Rastogi and Co., Meerut.
- Hammond, J., McGarvey, P. and Yusibov, V. (2000). Plant Biotechnology. Springer Verlag, New York.
- Johri, B. M. (1982). Experimental Embryology of Vascular Plants. Narosha Publishing House, New Delhi.
- Ketchum, P. A. (1988). Microbiology: Concepts and Application. John Wiley & Sons Inc., New York.



**BIOFERTILIZER AND BIOPESTICIDES - U16NMBO2**

**Semester : V**  
**Instruction Hours/Week : 2**

**Major Elective-II**  
**Credit : 2**

**UNIT-I**

Scope and importance of biofertilizers - *Rhizobium* - Mass Multiplication - application

**UNIT-II**

*Azospirillum* and *Azotobacter* - Mass Multiplication - application

**UNIT-III**

Cyanobacteria (*Anabaena*) and *Azolla* - Mass Multiplication-application

**UNIT-IV**

Vasicular Arbuscular Mycorrhizae (VAM) –Isolation, multiplication, application

**UNIT-V**

Biopesticides - *Bacillus thuringiensis* and *Trichoderma viride*

**Units 1 -3: Teaching - 1 h / week**  
**Unit 4 &5 : Teaching - 1 h / week;**

**Textbook**

- N. S. Subba Rao - Agricultural Microbiology.

**Reference Books**

- Norris, J. R., Read, D. J. and Verma, A. K. - Methods in Microbiology. Vol. XXIV
  - Whitton & Carr - Biology of Cyanobacteria.
  - Sprent and Sprent - Nitrogen Fixation.
-

**CORE COURSE IX - U16BO11P**  
**PRACTICAL III (Pertaining to BO7, BO11 & BO12)**

**Semester : V & VI**  
**Instruction Hours/Week: 3+3**

**Core Course: IX**  
**Credit : 5**

**Cell and Molecular Biology**

1. Observation of plant cells in the onion scale leaf peeling and *Rheo* Leaf epidermis
2. Non-living inclusions: Raphides, cystolith and Starch grains (spotters).
3. Cell division: Observation of mitotic stages - Squash technique in onion root tips
4. Study of ultra Structure of organelles using photographs (spotters)

**CORE COURSE X - U16BO12P  
PRACTICAL IV (Pertaining to BO8 & BO13)**

**Semester : V & VI  
Instruction Hours/Week: 3+3**

**Core Course: X  
Credit : 5**

**Morphology, Taxonomy and Economic Botany**

1. Study on inflorescence types and fruits as given in theory (spotters only)
2. Morphological description of plants, training in dissection, observation, identification, sketching of floral parts, drawing floral diagram and describing it technically in terms of floral formula of different plants belonging to the families mentioned in theory
3. Study on the economic importance of plants, covered in Core Course-X (spotters)
4. Field study of flora and submission of **10 herbarium specimens**.

**GENETICS PLANT BREEDING AND EVOLUTION - U16BO13**

**Semester : VI**  
**Instruction Hours/Week : 6**

**Core Course : XI**  
**Credit : 6**

**UNIT-I** (Teaching-1 h / week)

Genetics: Mendel's laws, monohybrid, dihybrid, back cross and test cross. Allelic interactions: Incomplete dominance and co-dominance - complementary factor hypothesis, epistasis (Dominant and recessive), Non allelic interaction -Lethal factor, Multiple factor hypothesis

**UNIT-II** (Teaching-1 h / week)

Recombination – Linkage & crossing over- mechanism of crossing over - . Linkage – illustration in *Lathyrus odoratus* – linkage mapping of genes - sex linkage – linkage of eye colour in *Drosophila* and colour blindness in man. Cytoplasmic inheritance – illustration. Sex determination in plants and *Drosophila*.

**UNIT-III** (Teaching-1 h / week)

Biochemical genetics - Experiment in *Neurospora*, Types of genes –mobile genes split genes Functional units of gene - cistron, recon, muton, codon and operon. Mechanism of Gene action.

Mutation – classification, types (physical and chemical mutagens) and application (role of mutation in evolution)

**UNIT-IV** (Teaching-1 h / week)

Plant breeding – Indroduction- selection - hybridization. Mass- pureline- clonal- Polyploidy - autopolyploidy and allopolyploidy - Hetersis- crop improments.

**UNIT-V** (Teaching-1 h / week)

Evolution - Evolutionary concepts- Theories of Lamarck, Charles Darwin and the modern synthetic theories. Population genetics – gene pool, gene frequency and Hardy-Weinberg law. Factors affecting gene frequencies.

**References****Genetics**

- Sinnott, E. W., Dunn, L. C. and Dobshansky, J. (1958). Principles of Genetics. (5th ed.) McGraw Hill, New York.
- Winchester, A. M. (1958). Genetics (3rd ed). Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Singleton, R. (1963). Elementary Genetics. D. Van Nostrand Co. Ltd. Inc., New York.
- Chandrasekaran, S. N. and Parthasarathy, S. V. (1965). Cytogenetics and Plant Breeding. P. Varadhachari & Co., Madras.
- Strickberger, M. W. (1976). Genetics (2nd ed.). MacMillan Publishing Co. Inc., New York.
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- Hexter, W. and Yost, H. T. (Jr.). (1977). The Science of Genetics. Prentice Hall of India (P) Ltd., New Delhi.

- Watson, J. D. (1977). *Molecular Biology of the Gene*. W. A. Benjamin Inc., California.
- Srb, A. M., Owen, R. D. and Edgar, R. S. (1979). *General Genetics*. Eurasia Publishing House (P) Ltd., New Delhi.
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- Dnyansagar, V. R. (1986). *Cytology & Genetics*. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Palaniyappan, S. (1987). *Marabiyal (Genetics)* (In Tamil). V. K. Publishing House, Chennai.
- Sinha, U. and Sinha, S. (1989). *Cytogenetics, Plant Breeding & Evolution*. Vikas Publishing House (P) Ltd., Delhi.
- Ahluwalia, K. B. (1990). *Genetics*. Wiley Eastern Ltd., New Delhi.
- Sandhya Mitra (1994). *Genetics: A Blue Print of Life*. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Sarin, C. (1994). *Genetics*. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
- Renganathan, T. K. and Shanmugavel, S. (1996). *Genetics and Genetic Engineering*. Commercial Offset Printers, Sivakasi.
- Winter, P. C., Hickey, G. I. and Fletcher, H. L. (1999). *Instant Notes in Genetics*. Viva Books (P) Ltd., New Delhi.
- Jain, H. K. (1999). *Genetics: Principles, Concepts and Implications*. Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Meyyan, R. P. (2000). *Genetics & Evolution*. Saras Publication, Nagercoil.
- Gupta, P. K. (2000). *Genetics*. Rastogi and Co., Meerut.
- Agarwal, V. K. (2000). *Simplified Course in Genetics*. S. Chand & Co. Ltd., New Delhi.
- Daniel Sundararaj, D. and Thulsidas, G. (1972). *Introduction to Cytogenetics and Plant Breeding*. (3rd ed). Popular Book Depot, Madras.

### **Evolution**

- Savage, J. M. (1969). *Evolution* (2nd ed). Amarind Publishing (P) Ltd., New Delhi.
- Gottlieb, L. D. and Jain, S. K. (1988). *Plant Evolutionary Biology*. Chapman & Hill, London.
- Shukla, R. S. and Chandel, P. S. (1996). *Cytogenetics, Evolution and Plant Breeding*. S. Chand & Co. Ltd., New Delhi.
- Verma, P. S. and Agarwal, V. K. (1999). *Concepts of Evolution*. S. Chand & Co. Ltd., New Delhi.
- Anna Sproule (1998). *Charles Darwin Scientists who have changed the World*. Orient Longmans, Hyderabad.

## PLANT PHYSIOLOGY AND ECOLOGY - U16BO14

**Semester : VI**  
**Instruction Hours/Week : 6**

**Core Course : XII**  
**Credit : 6**

### **UNIT-I (Teaching-1 h / week)**

Water relations: Significance of water osmosis – OP- TP water potential -osmotic and non-osmotic uptake of water - Ascent of sap-cohesion theory: Root pressure, transpiration- Pull theory, Physiology of stomatal action, Translocation of solutes and assimilates - Mass flow hypothesis - Membrane permeability mineral uptake: Passive and active - Role of major and minor elements - Mineral deficiency symptoms.

### **UNIT-II (Teaching-2 hrs / week)**

Photosynthesis: Absorption spectrum, Action spectrum, role of pigments, Emerson enhancement effect, Light reaction - Photosystems I & II - Photosynthetic electron transport, cyclic and non cyclic. Photophosphorylation. Dark reaction - Carbon Assimilation: - Calvin cycle, Hatch & Slack pathway, CAM pathway. Respiration: Respiratory substrates – respiratory quotient, aerobic and anaerobic respiration (fermentation), Glycolysis, Krebs's cycle and electron transport - oxidative phosphorylation – energetic of respiration.

### **UNIT-III (Teaching-1 h / week)**

Plant Growth regulators – study of auxins, gibberellins, cytokinin, abscisic acid ethylene –role of plant growth regulators. Photoperiodism – concepts – photoperiodism and flowering - mechanism in light, dark new neutral plants. Phytochrome – properties and role in flowering. Vernalization – definition, process and application .

### **UNIT-IV (Teaching-1 h / week)**

Autecology- Synecology - Plant Environmental factors - Climatic, edaphic and biotic factors. Ecosystem concept - Ecological pyramids – upright and inverted types; Food chain – grazing and detritus types; Food web – basic concepts; energy flow in ecosystem – basic concepts and description of universal energy flow model - Plant succession – various types – detailed study on hydrosere and xerosere.

### **UNIT-V (Teaching-1 h / week)**

Pollution: Cause, effects and control of Air pollution, Soil pollution, Water pollution, Radiation pollution, Noise pollution and Thermal pollution. Global warming and acid rain.

## **References**

### **Plant Physiology**

- Steward, F. C. (1964). Plant at Work (A summary of Plant Physiology). Addison-Wesley Publishing Co. Inc., London.
- Devlin, R. M. (1969). Plant Physiology. Holt, Rinehart & Winston, New Delhi.
- Noggle, R. and Fritz (1989). Introductory Plant Physiology. Prentice Hall of India (P) Ltd., New Delhi.
- Lawlor, D. W. (1989). Photosynthesis, Metabolism, Control and Physiology. ELBS Longmans, London.
- Mayer Anderson and Bonning (1965). Introduction to Plant Physiology. D. Van Nostrand Publishing Co., New York.

- Saraswathy Rangamannar (1973). *Thaavara Valarchithai Martram (Metabolism and Biosynthesis)* (in Tamil). Tamil Nadu Textbook Society.
- Periyasamy, K. (1978). *Cell Iyakka Viyal (Cell Physiology)* (in Tamil). Tamil Nadu Textbook Society.
- Hans Meidner (1984). *Class Experiments in Plant Physiology*. George Allen & Unwin, London.
- Srivastava, H. N. (1986). *Plant Physiology*. Pradeep Publications, Jalandhar.
- Jain, V. K. (1990). *Fundamentals of Plant Physiology*. S. Chand & Co. Ltd., New Delhi.
- Pandey, S. N. (1991). *Plant Physiology*. Vikas Publishing House (P) Ltd., New Delhi.
- Mukherjee, S. and Ghosh, A. K. (1998). *Plant Physiology*. Tata McGraw Hill Publishing Co. Ltd., New Delhi.
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- Salisbury, F. B. and Ross, C. W. (1999). *Plant Physiology*. CBS Publishers and Printers, New Delhi.
- Gill, P. S. (2000). *Plant Physiology*. S. Chand & Co. Ltd., New Delhi.
- Verma, V. (2001). *A Textbok of Plant Physiology*. Emkay Publications, New Delhi.

### **Ecology**

- Puri, G. S. (1960). *Indian Forest Ecology (Vol. I & II)*, Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Billings, W. B. (1965). *Plants and Ecosystem*.
- Misra, R. (1968). *The Ecology Workbook*. Oxford & INH Publishing Co., Calcutta.
- Odum, E. P. (1971). *Fundamentals of Ecology*. Saunders & Co., Philadelphia.
- Ambasht, R. S. (1974). *Textbook of Plant Ecology*. Students & Friends Co., Varanasi.
- Odum, E. P. (1975). *Ecology*. Holt, Rinert & Winston.
- Oosting, H. G. (1978). *Plant and Ecosystem*. Wadworth Belmont.
- Kochhar, P. L. (1975). *Plant Ecology*. S. Nagi & Co., Jullandhar.
- Shukla, R. S. and Chandel, P. S. (1991). *Plant Ecology and Soil Science*. S. Chand & Co. Ltd., New Delhi.
- Arumugam, N. (1994). *Concepts of Ecology (Environmental Biology)*. Saras Publications, Nagrcoil.
- Verma, P. S. and Agarwal, V. K. (1999). *Concept of Ecology (Environmental Biology)*. S. Chand & Co. Ltd., New Delhi.

**BIOCHEMISTRY, BIOPHYSICS AND BIOINSTRUMENTATION - U16BO15**

**Semester : VI**  
**Instruction Hours/Week : 6**

**Core Course : XIII**  
**Credit : 6**

**UNIT-I** (Teaching-1 h / week)

Concepts and properties of biological molecules: Electrovalent, Covalent, Polar Coordinate, and non-covalent bonds and their importance.

Carbohydrates, Classification. Properties and functions of monosaccharides, disaccharides and polysaccharides, Structure of monosaccharides (glucose and fructose), disaccharides (Sucrose and lactose) and polysaccharides (starch and glycogen,).

**UNIT-II** (Teaching-1 h / week)

Amino acids - Structure, classification and properties.

Proteins: Formation of protein- Structure- primary, secondary, tertiary and quaternary structures; Classification and functions of protein; proteolysis

**UNIT-III** (Teaching-1 h / week)

Enzymes: Nomenclature, classification and properties. Mechanism of action – active site - Fischer's Lock and Key model –. Enzyme kinetics – Km Value and Vmax. Factors - enzyme inhibitors- competitive, uncompetitive, and non-competitive. Factors affecting enzyme activity.

Lipids – Genetal structure alcohols and fatty acids. Classification, properties and and functions of lipids.

**UNIT-IV** (Teaching-1 h / week)

Nucleic acids –structure and functions of DNA and RNA.

Secondary metabolites in plants. Biosynthetic pathway of major secondary metabolic compounds (terpenoid). Significance of alkaloids, terpenoids, phenols, lignin, flavonoids and anthocyanins.

Biophysics: Electromagnetic radiation. Properties and components of light. Laws of Thermodynamics –first, second and third laws with illustration. Enthalpy and entropy. Bioenergetics – synthesis and degradation of ATP

**UNIT-V** (Teaching-2 hrs / week)

Homogenization technique: Methods of homogenization- Mortar Pestle

**Separation technique:** Ultra sonication Principle, instrumentation, operation and uses of centrifuge, chromatography and electrophoresis pH meter- PAGE

**Analytical technique:** Principle, instrumentation, operation and uses colorimeter and spectrophotometer.



**References****Biochemistry**

- Jain, J. L. (1979). Fundamentals of Biochemistry. S. Chand & Co. Ltd., New Delhi.
- Conn, E. and Stumpf, P. K. (1979). Outline of Biochemistry. Wiley Eastern Ltd., New Delhi.
- Metz, E. T. (1960). Elements of Biochemistry. V. F. & S (P) Ltd., Bombay

**Biophysics**

- Casey, E. J. (1969). Biophysics - Concepts and Mechanisms - Van Nostrand Reinhold Co., New Delhi
- Narayanan, P. (2000). Essentials of Biophysics. New Age international Publishers (P) Ltd., New Delhi.
- Annie and Arumugam, N. (2000). Biochemistry and Biophysics. Saras Publications, Nagercoil.
- Salil Bose, S. (1982). Elementary Biophysics. Vijaya Printers, Madurai.

**BIostatistics AND BIOinformatics – U16BO16E**

**Semester : VI**  
**Instruction Hours/Week : 5**

**Elective Course : III**  
**Credit : 4**

**UNIT-I** (Teaching-1 h / week)

Biostatistics: Definition and scope. Data – primary and secondary; discrete and continuous. Sample and population.

Sampling techniques: Random and non-random sampling techniques

Presentation of data: - Graphical methods: Histogram, Bar Chart and Pie diagram.

**UNIT-II** (Teaching-1 h / week)

Measures of central tendency- Mean, median and mode. Standard Deviation and Standard Error.

**UNIT-III** (Teaching-1 h / week)

Correlation: General account and correlation and regression.

Distribution types: Probability, normal binomial and Poisson distribution. Probability analysis

**UNIT-IV** (Teaching-1 h / week)

Bioinformatics: History, scope and application of bioinformatics. Terminology used in bioinformatics.

Biological Databases: Classification – Sequence, structural, composite databases. Nucleic acid databases – Genbank (NCBI, EMBL and DDBJ)

**UNIT-V** (Teaching-1 h / week)

Protein databases: PDB (Primary, secondary, tertiary and quaternary structure) and SwissPROT.

Bioinformatics: Challenges and applications. Internet and its role.

**Reference**

- Olive Jean Dunn - Basic Statistics - A primer for the Biomedical Sciences - John Wiley and Sons.
- Nageswara Rao, G. - Statistics for Agricultural Science - Oxford & IBH Publishing Co. Pvt. Ltd., New Delhi.
- Bryan Bergeron (2003) - Bioinformatics Computing. Prentice Hall of India Pvt. Ltd., New Delhi.
- Gautham, N. (2006) - Bioinformatics Database and Algorithms - Narosa Publishing House, New Delhi.
- Murthy, C. S. V. (2003) - Bioinformatics - Himalayas Publishing House.
- Ranga (2003) - Bioinformatics - Agrobios, India.
- David E. Mount (2001) - Bioinformatics Sequence and Genome Analysis - Cold Spring Harbour Laboratory Press, New Delhi.
- Shanmugavel (2005) - Principles of Bioinformatics - Pointer Publisher, India.
- Andreas D Baxevanis and Francis, B. F. (2001) - Bioinformatics - John Willy & Sons
- Westhead (2003) - Bioinformatics - Viva Books Pvt. Ltd.
- Ignacimuthu, S. (2005) - Basic Bioinformatics - Narsa Publishing House.

**SEMESTER – II**  
**U16SBE1**

**COURSE CODE:**

**PART – IV: COMPUTER APPLICATIONS – I - OFFICE AUTOMATION**  
**HOURS: 2 CREDITS: 2**

**UNIT I:**

MS- Word- Introduction to Computers - Hardware - Software, Operating System: Windows XP -MS- Paint, Notepad, WordPad, Introduction to MS-Word, Creating, Editing and Formatting Document - Working with Drawing objects - Text Manipulation

**UNIT II:**

Working with Tables – Columns – Labels - Plotting, editing and Filling drawing objectsBookmark – Header & Footer - Checking and Correcting a document - Creating Labels – Envelops – Mail Merge – Formatted output and Report generation Printing Documents, Working with Internet.

**UNIT III:**

Ms – Excel - Ms – Excel: Introduction – Data Entry – Cell Formatting - Plotting Graphs – Workbook Features – Library Functions

**UNIT IV:**

Conditional Functions and Data Sorting – Limit the data on a worksheet - Data Validation –Data consolidation - Chart creation - Checking and Correcting Data - Tracking and Managing Changes- Advanced Features

**UNIT V:**

MS – PowerPoint- Introduction - Creating, Editing and Formatting Presentation – Applying Transition and Animation Effects - Applying Design Templates - Viewing and Setting up a Slide Show - Navigating among Different Views - Ms Outlook: Introduction to Folder List – Address Book.

**TEXTBOOKS**

1. Jill Murphy, Microsoft Office Word- Comprehensive Course, Labyrinth Publications, 2003.
2. McGraw-Hill/Irwin-Deborah Hinkle, Microsoft Office 2003 PowerPoint: A Professional Approach, Comprehensive w/ Student CD, New Delhi, 2003.
3. Nellai Kannan, C., MS-Office, Nels Publications, Tamil Nadu, 2002.

SEMESTER – III

COURSE CODE: U16SBE2

**PART – IV: COMPUTER APPLICATIONS - II - DESKTOP PUBLISHING****HOURS: 2****CREDITS: 2****UNIT I:**

Photoshop Tools : Move, Type, Marquee, Lasso, Crop, Shapes, Healing, Brush, Patch, Cloning Stamp, Eraser, Gradient, Blur, Smudge, Dodge, Pen, Eye Dropper, Patch selection and Zoom tool.

Layer: New layer, Layer set, Duplicate layer, Rasterize and Merge down  
Layer Styles: Drop shadow, inner shadow, outer glow & inner glow, Bevel and Emboss, Gradient overlay, Stroke. Text formatting

**UNIT II:**

File: Save, File formats, Page set up. Edit:

Check spelling, Copy merged, Fill, Transform, Define pattern.

Image: Motion blur, Twirl, lens flare, Glowing edges, lighting effects, solarize, water paper, Stained glass, Mosaic Tiles.

Window: Character and Paragraph settings.

**COREL DRAW:****UNIT III:**

Drawing Tools: Pick, Shape, Knife, eraser, Smudge, Roughen brush, free transform, Zoom ,hand, Free hand, Bezier, Artistic, Pen, Poly line, Point, Interactive connective, Spiral tool.

Colour Tool: Paint Bucket Tool, Eye Dropper, Fill Tools. Fill Options, Stroke Options.

**UNIT IV:**

Special Effects: 3D effects, Add perspective, Blend, Contour, Artistic media, lens, and Power clip.

Shaping \_\_\_\_\_ Options: Weld, trim, Intersect.

Text Effects: Format text, bullet, and fit text to path, align and straighten, spell check.

File Menu: Save, Save as, Import, Page set Up.

**PAGE MAKER:**

**UNIT V:**

**Page Maker Tools:** Pointer, Rotate, Line, Rectangle, Ellipse, Polygon, Hand, Text, Crop, Rectangle frame tools. Text layout, Style and Objects: Alignments, Styles, fill, frame options, Stroke, Group, Lock, unlock, mask, polygon settings character and paragraph settings.

**Text Editing:** Edit story: Undo, Redo, Cut, Copy, Paste, paste Special, Spelling check and Find.

**File:** Page set up, save, Save as.

**TEXTBOOKS**

1. CorelDraw IN Simple Steps – Shalini Gupta Corel DRAW Bible - DEBORAH MILLER
2. Teach Yourself Adobe Photoshop – Rose Carla Adobe Photoshop Cs Classroom in a Book by Adobe Press.
3. Using Microsoft Word - Asmita Bhatt Pagemaker In Easy Steps - Scott Basham Ctoa Material By Genesis.

**SEMESTER – III****COURSE CODE: U16SBE3P****PART – IV: COMPUTER APPLICATIONS – II PRACTICAL (DTP LAB)****HOURS: 2****CREDITS: 2****OFFICE AUTOMATION & DESKTOP PUBLISHING LAB****UNIT I:****Office Automation**

1. MS – Word: Text Formatting, Mail Merge
2. Ms – Excel: Implement the Statistical & Mathematical Function  
( Using Min ,Max, Median, Average, Standard Deviation, Correlation, Logical 'if' Condition ) for the  
given

data, Prepare a Chart for a given Data using Pie diagram / Histogram

**UNIT II:****Photoshop**

3. Design a College Broacher / Birthday Card.
4. Cropping, rotating and Overlapping the image.
5. Create a single image from Multiple image.
6. Creating an image with multilayer's.

**UNIT III:****Corel Draw**

7. Design a Visiting Card \ Greeting Card using Draw & Text tools.
8. Create a logo for a Company \ College.

**UNIT IV:****Page Maker**

9. Type and format a letter using text tool.
10. Prepare a Invitation for College Day /Sports Day.

**SEMESTER – I**  
**U16ES**

**COURSE CODE:**

**PART – IV: ENVIRONMENTAL STUDIES**

**HOURS: 2**

**CREDITS: 2**

**UNIT I:**

Environment and Natural Resources: Definition, scope, importance of Environmental Studies - Need for public awareness. Natural resources — classification - Associated problems a) Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forest and tribal people. b) Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems. c) Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies. d) Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies. e) Energy resources: Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. Case studies f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification • Role of an individual in conservation of natural resources • Equitable use of resources for sustainable lifestyles.

**UNIT II:**

Ecosystems • Concept of an ecosystem • Structure and function of an ecosystem • Producers, consumers and decomposers • Energy flow in the ecosystem • Ecological succession • Food chains, food webs and ecological pyramids • Introduction, types, characteristic features, structure and function of the following ecosystem: a. Forest ecosystem b. Grassland ecosystem c. Desert ecosystem d. Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

**UNIT III:**

Biodiversity and its conservation • Introduction — Definition: genetic, species and ecosystem diversity • Biogeographical classification of India • Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values • Biodiversity at global, National and local levels • India as a mega-diversity nation • Hot-spots of biodiversity • Threats to

biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts • Endangered and endemic species of India • Conservation of biodiversity In-situ and Ex-situ conservation of biodiversity

#### **UNIT IV:**

Environmental Pollution Definition • Cause, effects and control measures of a. Air pollution b. Water pollution c. Soil pollution d. Marine pollution e. Noise pollution f. Thermal pollution g. Nuclear hazards • Solid waste Management : Causes, effects and control measures of urban and industrial wastes • Role of an individual in prevention of pollution • Pollution case studies • Disaster management floods, earthquake, cyclone and landslides.

#### **UNIT V:**

Social Issues and the Environment • From Unsustainable to Sustainable development • Urban problems related to energy • Water conservation, rain water harvesting, watershed management • Resettlement and rehabilitation of people; its problems and concerns. Case Studies • Environmental ethics: Issues and possible solutions. • Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies • Wasteland reclamation • Consumerism and waste products • Environment Protection Act. • Air (Prevention and Control of Pollution) Act. • Water (Prevention and control of Pollution) Act • Wildlife Protection Act • Forest Conservation Act • Issues involved in enforcement of environmental legislation. • Public awareness.

#### **TEXTBOOKS**

1. Ekambaranatha Ayyar.M. and T.N. Ananthakrishnan, 1992. Manual of Zoology Vol. 1 [Invertebrata], parts I and II.S. Viswanathan (Printers and Publishers) Pvt. Ltd; Madras.
2. Agarwal, K.C. 2001 Environmental Biology, Nidi Pubi. Ltd. Bikaner.
3. Sharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad.
4. Brunner R.C., 1989, Hazardous Waste Incineration, McGraw Hill Inc.
5. Clark R.S., Marine Pollution, Clarendon Press Oxford (TB)
6. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Publ. House, Mumbai,
7. De A.K., Environmental Chemistry, Wiley Eastern Ltd.
8. Down to Earth, Centre for Science and Environment (R)



9. Gleick, H.P. 1993. Water in crisis, Pacific Institute for Studies in Dev., Environment & Security. Stockholm Env. Institute Oxford Univ. Press.
  10. Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
  11. Heywood, V.H & Waston, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press
  12. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi.
  13. Mckinney, M.L. & School, R.M. 1996. Environmental Science systems & Solutions, Web enhanced edition.
  14. Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
  15. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
  16. Odum, E.P. 1971. Fundamentals of Ecology. W.B. Saunders Co. USA.
  17. Rao M N. & Datta, A.K. 1987. Waste Water treatment. Oxford & IBH Pubi. Co. Pvt. Ltd.
  18. Sharma B.K., 2001. Environmental Chemistry. Geol Pubi. House, Meerut
  19. Survey of the Environment, The Hindu (M)
  20. Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science (TB)
  21. Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
  22. Wanger K.D., 1998 Environmental Management. W.B. Saunders Co. Philadelphia, USA
- (M) Magazine (R) Reference (TB) Textbook

**SEMESTER – IV****COURSE CODE: U16VE****PART – IV: VALUE EDUCATION****HOURS: 1****CREDITS: 2****UNIT I:**

PHILOSOPHY OF LIFE Human Life on Earth ( Kural 629), Purpose of Life ( Kural 46) Meaning and Philosophy of Life( Kural 131, 226) The Law of Nature (Kural 374) Glorifying All form of Life in this Universe (Kural 322, 327) – Protecting Nature /Universe (Kural 16, 20, 1038)

**UNIT II:**

INDIVIDUAL QUALITIES Basic Culture (Kural 72, 431) Thought Analysis (Kural 282, 467, 666) Regulating desire (Kural 367), Guarding against anger (Kural 158, 305, 306, 314), To get rid of Anxiety (Kural 629), The Rewards of Blessing (Kural 3), Benevolence of Friendship (Kural 786), Love and Charity (Kural 76), Self – tranquility/Peace (Kural 318)

**UNIT III:**

SOCIAL VALUES (INDIVIDUAL AND SOCIAL WELFARE) Family (Kural 45), Peace in Family (Kural 1025), Society (Kural 446), The Law of Life (Kural 952), Brotherhood (Kural 807) , The Pride of Womanhood (Kural 56) Five responsibilities/duties of Man : a) to himself, b) to his family, c) to his environment, d) to his society, e) to the Universe in his lives (Kural 43, 981), Thriftness (Thrift)/Economics (Kural 754), Health (Kural 298), Education (Kural 400), Governance (Kural 691), People's responsibility/ duties of the community (Kural 37), World peace (Kural 572)

**UNIT IV:**

MIND CULTURE Mind Culture (Kural 457) Life and Mind - Bio - magnetism, Universal Magnetism (God – Realization and Self Realization) - Genetic Centre – Thought Action – Short term Memory – Expansiveness – Thought – Waves, Channelising the Mind, Stages - Meditation (Kural 261, 266, 270), Spiritual Value (Kural 423)

**UNIT V:**

TENDING PERSONAL HEALTH Structure of the body, the three forces of the body, life body relation, natural causes and unnatural causes for diseases (Kural 941), Methods in Curing diseases (Kural 948, 949) The Five units, simple physical exercises.

**TEXTBOOKS**

1. Philosophy of Universal Magnetism (Bio-magnetism, Universal Magnetism) The World Community Service Centre Vethatri Publications (for Unit IV)
2. Pope, G.U., Dr. Rev., Thirukkural with English Translation, Uma Publication, 156, Serfoji Nagar, Medical College Road, Thanjavur 613004 (for All Units)
3. Value Education for Health, Happiness and Harmony, The World Community Service Centre Vethatri Publications (for All Units)

**SEMESTER – V**  
**U16SS**

**COURSE CODE:**

**PART – IV: SOFT SKILLS**

**HOURS: 2**

**CREDITS: 2**

**UNIT I:**

Know Thyself / Understanding Self Introduction to soft skills self discovery – Developing positive attitude – Improving perceptions – Forming values.

**UNIT II:**

Interpersonal Skills/ Understanding Others Developing interpersonal relationship –Team building – group dynamics –Net working- Improved work relationship

**UNIT III:**

Communication Skills/ Communication with others Art of Listening –Art of reading –Art of speaking – Art of writing –Art of writing emails-e mail etiquette

**UNIT IV:**

Corporate Skills/ Working with Others Developing body language –Practising etiquette and mannerism – Time management – Stress management.

**UNIT V:**

Selling Self/ Job Hunting Writing resume /cv-interview skills – Group discussion –Mock interview Mock GD –Goal setting –Career planning

**TEXT BOOKS**

1. Meena. K and V.Ayothi (2013) A Book on Development of Soft Skills (Soft Skills: A Road Map to Success) P.R. Publishers & Distributors, No, B-20 &21, V.M.M Complex, Chatiram Bus Stand, Tiruchirapalli -620 002. (Phone No: 0431-2702824: Mobile No: 94433 70597, 98430 7442) Alex K. (2012)
2. Soft Skills – Know Yourself & Know the World, S.Chand & Company LTD, Ram Nagar, New Delhi -110 055. Mobile No: 94425 14814(Dr.K.Alex)

**REFERENCE BOOKS**

1. Developing the leader within you John C Maxwell
2. Good to Great by Jim Collins
3. The Seven habits of highly effective people Stephen Covey
4. Emotional Intelligence Daniel Goleman
5. You can Win Shive Khera

Principle                      centred                      leadership                      Stephen                      Covey

**SEMESTER – VI**  
**U16GS**

**COURSE CODE:**

**PART – V: GENDER STUDIES**

**HOURS: 1**

**CREDITS: 1**

**UNIT I:**

Concepts of Gender: Sex-Gender-Biological Determinism- Patriarchy- Feminism -Gender Discrimination -Gender Division of Labour -Gender Stereotyping-Gender Sensitivity - Gender Equity —Equality-Gender Mainstreaming Empowerment

**UNIT II:**

Women's Studies Vs Gender Studies: UGC's Guidelines - VII to XI Plans- Gender Studies: Beijing Conference and CEDAW-Exclusiveness and Inclusiveness.

**UNIT III:**

Areas of Gender Discrimination: Family Sex Ratio-Literacy -Health -Governance Religion Work Vs Employment- Market - Media - Politics Law Domestic Violence — Sexual Harassment — State Policies and Planning

**UNIT IV:**

Women Development and Gender Empowerment: Initiatives International Women's Decade - International Women's Year - National Policy for Empowerment of Women - Women Empowerment Year 2001- Mainstreaming Global Policies.

**UNIT V:**

Women's Movements and Safeguarding Mechanism:— In India National / State Commission for Women (NCW) - All Women Police Station Family Court- Domestic Violence Act - Prevention of Sexual Harassment at Work Place Supreme Court Guidelines - Maternity Benefit Act - PNDT Act - Hindu Succession Act 2003 Eve Teasing Prevention Act - Self Help Groups 73 and 74 Amendment for PRIS.

**TEXTBOOKS**

1. Bhasin Kamala, Understanding Gender: Gender Basics, New Delhi: Women Unlimited 2004
2. Bhasin Kamala, Exploring Masculinity: Gender Basics, New Delhi: Women Unlimited, 2004
3. Bhasin Kamala, What is Patriarchy? : Gender Basics, New Delhi: Women Unlimited, 1993
4. Pernau Margrit Ahmad Imtiaz, Reifeld Hermut (ed.) Family and Gender: Changing Values in Germany and India, New Delhi: Sage Publications, 2003
5. Agarwal Bina, Humphries Jane and Robeyns Ingrid (ed.)
6. Capabilities, Freedom, and Equality: Amartya Sen's Work from a Gender Perspective, New Delhi: Oxford University Press, 2006
7. Rajadurai.S.V, Geetha.V, Themes in Caste Gender and Religion, Tiruchirappalli: Bharathidasan University, 2007 Misra Geetanjali, Chandiramani Radhika (ed.)
8. Sexuality, Gender and Rights: Exploring Theory and Practice in South and Southeast Asia, New Delhi: Sage Publication, 2005 Rao Anupama (ed.)
9. Gender &Caste: Issues in Contemporary Indian Feminism, New Delhi: Kali for Women, 2003
10. Saha Chandana, Gender Equity and Gender Equality: Study of Girl Child in Rajasthan, Jaipur: Rawat Publications, 2003
11. Krishna Sumi, (ed.) Livelihood and Gender Equity in Community Resource Management New Delhi: Sage Publication, 2004
12. Wharton .S Amy, The Sociology of Gender: An Introduction to Theory and Research, USA: Blackwell Publishing, 2005.
13. Mohanty Manoranjan (ed.) Class, Caste, Gender: Readings in Indian Government and Politics- 5, New Delhi: Sage Publications, 2004.
14. Arya Sadhna, Women, Gender Equality and the State, New Delhi: Deep & Deep Publications, 2000.