Bachelor of Technology (Bioinformatics)

Programme Code: BTF

Duration – 4 Years Full Time

Programme Structure

And

Curriculum & Scheme of Examination

2010

AMITY UNIVERSITY UTTAR PRADESH
GAUTAM BUDDHA NAGAR
Amity University aims to achieve academic excellence by providing multi-faceted education to students and encourage them to reach the pinnacle of success. The University has designed a system that would provide rigorous academic programme with necessary skills to enable them to excel in their careers.

This booklet contains the Programme Structure, the Detailed Curriculum and the Scheme of Examination. The Programme Structure includes the courses (Core and Elective), arranged semester wise. The importance of each course is defined in terms of credits attached to it. The credit units attached to each course has been further defined in terms of contact hours i.e. Lecture Hours (L), Tutorial Hours (T), Practical Hours (P). Towards earning credits in terms of contact hours, 1 Lecture and 1 Tutorial per week are rated as 1 credit each and 2 Practical hours per week are rated as 1 credit. Thus, for example, an L-T-P structure of 3-0-0 will have 3 credits, 3-1-0 will have 4 credits, and 3-1-2 will have 5 credits.

The Curriculum and Scheme of Examination of each course includes the course objectives, course contents, scheme of examination and the list of text and references. The scheme of examination defines the various components of evaluation and the weightage attached to each component. The different codes used for the components of evaluation and the weightage attached to them are:

<table>
<thead>
<tr>
<th>Components</th>
<th>Codes</th>
<th>Weightage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Case Discussion/ Presentation/ Analysis</td>
<td>C</td>
<td>05 - 10</td>
</tr>
<tr>
<td>Home Assignment</td>
<td>H</td>
<td>05 - 10</td>
</tr>
<tr>
<td>Project</td>
<td>P</td>
<td>05 - 10</td>
</tr>
<tr>
<td>Seminar</td>
<td>S</td>
<td>05 - 10</td>
</tr>
<tr>
<td>Viva</td>
<td>V</td>
<td>05 - 10</td>
</tr>
<tr>
<td>Quiz</td>
<td>Q</td>
<td>05 - 10</td>
</tr>
<tr>
<td>Class Test</td>
<td>CT</td>
<td>10 - 15</td>
</tr>
<tr>
<td>Attendance</td>
<td>A</td>
<td>05</td>
</tr>
<tr>
<td>End Semester Examination</td>
<td>EE</td>
<td>70</td>
</tr>
</tbody>
</table>

It is hoped that it will help the students study in a planned and a structured manner and promote effective learning. Wishing you an intellectually stimulating stay at Amity University.

July, 2010
PROGRAMME OBJECTIVE

In the era of ever increasing amount of biological data, it is equally important to manage the data as well as to interpret it correctly. Thus, a course in Bioinformatics will enable the students to compile all the available information in a systematic manner and also to determine the meaning and structure of the biological information available in the existing databases. It will help the students to understand the algorithms of mathematical tools on which the analysis of biological data is based. In a nutshell, it integrates the developments in information and computer technology as applied to Biotechnology and Biological Sciences.
### PROGRAMME STRUCTURE

#### FIRST SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lectures (L) Hours Per Week</th>
<th>Tutorial (T) Hours Per Week</th>
<th>Practical (P) Hours Per Week</th>
<th>Total Credits</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 101</td>
<td>Applied Mathematics - I</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BTF 102</td>
<td>Applied Physics - I</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 103</td>
<td>Applied Chemistry - I</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 104</td>
<td>Introduction to Computers</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>BTF 105</td>
<td>Life Sciences</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>BTF 106</td>
<td>Environmental Studies</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BTF 120</td>
<td>Applied Physics Lab - I</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 121</td>
<td>Applied Chemistry Lab - I</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 122</td>
<td>Programming in C Lab</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 123</td>
<td>Engineering Graphics Lab</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 143</td>
<td>Behavioural Science - I</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 144</td>
<td>Foreign Language - I</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 145</td>
<td>French</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 146</td>
<td>Spanish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 147</td>
<td>Japanese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 148</td>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** The students will study English from I\textsuperscript{st} semester but final evaluation will be done at the end of II\textsuperscript{nd} semester. However continuous evaluation will start from the I\textsuperscript{st} Semester.

#### SECOND SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lectures (L) Hours Per Week</th>
<th>Tutorial (T) Hours Per Week</th>
<th>Practical (P) Hours Per Week</th>
<th>Total Credits</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 201</td>
<td>Applied Mathematics - II</td>
<td>3</td>
<td>1</td>
<td>-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>BTF 202</td>
<td>Applied Physics - II</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 203</td>
<td>Applied Chemistry - II</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 204</td>
<td>Object Oriented Programming in C++</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 205</td>
<td>Electrical Science</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>BTF 220</td>
<td>Applied Physics Lab - II</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 221</td>
<td>Applied Chemistry Lab - II</td>
<td>-</td>
<td>2</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 222</td>
<td>Object Oriented Programming in C++ Lab</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 223</td>
<td>Electrical Science Lab</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 240</td>
<td>English</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 243</td>
<td>Behavioural Science - II</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>BTF 244</td>
<td>Foreign Language - II</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>BTF 245</td>
<td>French</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 246</td>
<td>Spanish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 247</td>
<td>Japanese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 248</td>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>25</td>
<td></td>
</tr>
</tbody>
</table>

#### TERM PAPER (DURING SUMMER BREAK)

#### THIRD SEMESTER

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Lectures (L) Hours Per Week</th>
<th>Tutorial (T) Hours Per Week</th>
<th>Practical (P) Hours Per Week</th>
<th>Total Credits</th>
<th>Page No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 301</td>
<td>Cell Biology</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 302</td>
<td>Biochemistry - I</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 303</td>
<td>Microbiology</td>
<td>3</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>BTF 304</td>
<td>Basics of Computer Systems &amp; Programming</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
<td>Lab Credits</td>
<td>Total Credits</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------</td>
<td>--------------------------------------------------</td>
<td>---------</td>
<td>-------------</td>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 305</td>
<td>Internet Technologies</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 320</td>
<td>Cell Biology Lab</td>
<td>-</td>
<td>-</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 321</td>
<td>Biochemistry - I &amp; Microbiology Lab</td>
<td>-</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 322</td>
<td>Computers Lab - I</td>
<td>-</td>
<td>1</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 323</td>
<td>Internet Technologies Lab</td>
<td>-</td>
<td>2</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 330</td>
<td>Term Paper (Evaluation)</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 341</td>
<td>Communication Skills - I</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 343</td>
<td>Behavioural Science - III</td>
<td>1</td>
<td>-</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 344</td>
<td>Foreign Language - III</td>
<td>2</td>
<td>-</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 345</td>
<td>German</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 346</td>
<td>Spanish</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 347</td>
<td>Japanese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 348</td>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**FOURTH SEMESTER**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Lab Credits</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 401</td>
<td>Biochemistry - II</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 402</td>
<td>Molecular Biology</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 403</td>
<td>Computers - II</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 404</td>
<td>Genetics</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 405</td>
<td>Statistics</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 406</td>
<td>Chemical Biology</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 420</td>
<td>Biochemistry Lab - II</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>BTF 421</td>
<td>Molecular Biology &amp; Genetics Lab</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>BTF 422</td>
<td>Computers Lab - II</td>
<td>-</td>
<td>4</td>
<td>2</td>
</tr>
<tr>
<td>BTF 441</td>
<td>Communication Skills - II</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>BTF 443</td>
<td>Behavioural Science - IV</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>BTF 444</td>
<td>Foreign Language - IV</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 445</td>
<td>German</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 446</td>
<td>Spanish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 447</td>
<td>Japanese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 448</td>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
<td></td>
<td>26</td>
</tr>
</tbody>
</table>

**SUMMER PROJECT - I (4 - 6 WEEKS)**

**FIFTH SEMESTER**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Lab Credits</th>
<th>Total Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 501</td>
<td>Structural Biology</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 502</td>
<td>Computational Biology – I</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 503</td>
<td>Immunology</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 504</td>
<td>Recombinant DNA Technology</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 505</td>
<td>Computers - III</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 520</td>
<td>Structural Biology Lab</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>BTF 521</td>
<td>Computational Biology Lab – I</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>BTF 522</td>
<td>Immunology Lab</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>BTF 523</td>
<td>Recombinant DNA Technology Lab</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>BTF 524</td>
<td>Computers Lab - III</td>
<td>-</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>BTF 541</td>
<td>Communication Skills - III</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>BTF 543</td>
<td>Behavioural Science - V</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>BTF 544</td>
<td>Foreign Language - V</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 545</td>
<td>German</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 546</td>
<td>Spanish</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 547</td>
<td>Japanese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 548</td>
<td>Chinese</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BTF 550</td>
<td>Summer Project - I</td>
<td></td>
<td></td>
<td>6</td>
</tr>
<tr>
<td>BTF 560</td>
<td>Summer Project - I (Evaluation)</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credit Hours</td>
<td>Lab Hours</td>
<td>Total Hours</td>
</tr>
<tr>
<td>-------------</td>
<td>--------------</td>
<td>--------------</td>
<td>-----------</td>
<td>-------------</td>
</tr>
<tr>
<td>BTF 601</td>
<td>Genomics</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 602</td>
<td>Computational Proteomics</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 603</td>
<td>Computational Biology - II</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 604</td>
<td>Bioinformatics Algorithms</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 605</td>
<td>Computers - IV</td>
<td>3</td>
<td>-</td>
<td>3</td>
</tr>
<tr>
<td>BTF 620</td>
<td>Genomics Lab</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BTF 621</td>
<td>Computational Proteomics Lab</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BTF 622</td>
<td>Computational Biology Lab - II</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BTF 623</td>
<td>Bioinformatics Algorithms Lab</td>
<td>-</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>BTF 624</td>
<td>Computers Lab - IV</td>
<td>-</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>BTF 641</td>
<td>Communication Skills – IV</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>BTF 642</td>
<td>Behavioural Science - VI</td>
<td>1</td>
<td>-</td>
<td>1</td>
</tr>
<tr>
<td>BTF 643</td>
<td>Foreign Language - VI</td>
<td>2</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 644</td>
<td>French</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 645</td>
<td>German</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 646</td>
<td>Spanish</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 647</td>
<td>Japanese</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 648</td>
<td>Chinese</td>
<td>-</td>
<td>-</td>
<td>2</td>
</tr>
<tr>
<td>BTF 660</td>
<td>Summer Project - II (4 - 6 WEEKS)</td>
<td>-</td>
<td>-</td>
<td>6</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>TOTAL</th>
<th>SUMMER PROJECT - II (4 - 6 WEEKS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 701</td>
<td>3</td>
<td>Clinical Data Management</td>
</tr>
<tr>
<td>BTF 702</td>
<td>3</td>
<td>Data Mining</td>
</tr>
<tr>
<td>BTF 703</td>
<td>2</td>
<td>SAS (Statistical Analysis System) &amp; R</td>
</tr>
<tr>
<td>BTF 704</td>
<td>2</td>
<td>ELECTIVE ( Any one)</td>
</tr>
<tr>
<td>BTF 705</td>
<td>2</td>
<td>BioPerl</td>
</tr>
<tr>
<td>BTF 706</td>
<td>2</td>
<td>BioJava</td>
</tr>
<tr>
<td>BTF 707</td>
<td>2</td>
<td>VB.NET</td>
</tr>
<tr>
<td>BTF 720</td>
<td>2</td>
<td>R &amp; Bioconductor Lab</td>
</tr>
<tr>
<td>BTF 721</td>
<td>2</td>
<td>Clinical Data Management Lab</td>
</tr>
<tr>
<td>BTF 722</td>
<td>2</td>
<td>Data Mining Lab</td>
</tr>
<tr>
<td>BTF 723</td>
<td>2</td>
<td>SAS (Statistical Analysis System) &amp; R Lab</td>
</tr>
<tr>
<td>BTF 724</td>
<td>2</td>
<td>ELECTIVE Lab (Any one)</td>
</tr>
<tr>
<td>BTF 725</td>
<td>2</td>
<td>BioPerl</td>
</tr>
<tr>
<td>BTF 726</td>
<td>2</td>
<td>BioJava</td>
</tr>
<tr>
<td>BTF 727</td>
<td>2</td>
<td>VB.NET</td>
</tr>
<tr>
<td>BTF 741</td>
<td>2</td>
<td>R &amp; Bioconductor Lab</td>
</tr>
<tr>
<td>BTF 742</td>
<td>2</td>
<td>Communication Skills - VII</td>
</tr>
<tr>
<td>BTF 743</td>
<td>2</td>
<td>Behavioural Science - VII</td>
</tr>
<tr>
<td>BTF 744</td>
<td>2</td>
<td>Foreign Language - VII</td>
</tr>
<tr>
<td>BTF 745</td>
<td>2</td>
<td>French</td>
</tr>
<tr>
<td>BTF 746</td>
<td>2</td>
<td>German</td>
</tr>
<tr>
<td>BTF 747</td>
<td>2</td>
<td>Spanish</td>
</tr>
<tr>
<td>BTF 748</td>
<td>2</td>
<td>Japanese</td>
</tr>
<tr>
<td>BTF 750</td>
<td>2</td>
<td>Chinese</td>
</tr>
<tr>
<td>BTF 760</td>
<td>2</td>
<td>Summer Project - II (Evaluation)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>TOTAL</th>
<th>EIGHTH SEMESTER</th>
</tr>
</thead>
<tbody>
<tr>
<td>BTF 801</td>
<td>3</td>
<td>Principles of Management &amp; Entrepreneurship Development</td>
</tr>
<tr>
<td>BTF 802</td>
<td>3</td>
<td>Project Management</td>
</tr>
<tr>
<td>Course Code</td>
<td>Course Title</td>
<td>Credits</td>
</tr>
<tr>
<td>------------</td>
<td>---------------------------------------</td>
<td>---------</td>
</tr>
<tr>
<td>BTF 803</td>
<td>Molecular Modeling &amp; Drug Designing</td>
<td>3</td>
</tr>
<tr>
<td>BTF 801</td>
<td>IPR and Regulatory issues</td>
<td>3</td>
</tr>
<tr>
<td>BTF 841</td>
<td>Communication Skills - VI</td>
<td>1</td>
</tr>
<tr>
<td>BTF 843</td>
<td>Behavioural Science - VIII</td>
<td>1</td>
</tr>
<tr>
<td>BTF 844</td>
<td>Foreign Language - VIII</td>
<td>2</td>
</tr>
<tr>
<td>BTF 845</td>
<td>French</td>
<td></td>
</tr>
<tr>
<td>BTF 846</td>
<td>German</td>
<td></td>
</tr>
<tr>
<td>BTF 847</td>
<td>Spanish</td>
<td></td>
</tr>
<tr>
<td>BTF 848</td>
<td>Japanese</td>
<td></td>
</tr>
<tr>
<td>BTF 849</td>
<td>Chinese</td>
<td></td>
</tr>
<tr>
<td>BTF 822</td>
<td>Molecular Modeling &amp; Drug Designing Lab</td>
<td>-</td>
</tr>
<tr>
<td>BTF 860</td>
<td>Major Project (12 Weeks)</td>
<td>-</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Curriculum & Scheme of Examination

APPLIED MATHEMATICS – I

Course Code: BTF 101          Credit Units: 04

Course Objective:
The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from Mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Differential Calculus
Derivative of a function, Derivatives at a point, Fundamental rules for differentiation: Product Rule, Quotient Rule and Chain Rule, Differentiation of Implicit Functions, Parametric forms and Logarithmic Differentiation, Successive differentiation, Leibnitz’s theorem (without proof), Mean value theorem, Taylor’s and Maclaurin’s Theorem, Asymptote & Curvature, Partial Differentiation, Euler’s Theorem, Maxima and Minima

Module II: Integral Calculus
Fundamental Integral Formulae, Methods of Integration: Integration by Substitution, By Parts, Partial Fractions, Definite Integral and its Properties, Reduction Formulae, Application to length, Area and Volume.

Module III: Ordinary Differential Equations
Definition of Order and Degree of differential equation, Formation of ODEs, Solution of Differential Equation of 1st Order and 1st Degree: Variable Separation, Homogeneous Differential Equations, Linear Differential Equations, Exact Differential Equations, General Linear ODE of Second Order, Solution of Homogeneous Equation, Solution of Simple Simultaneous ODE

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Differential Calculus by Shanti Narain
- Integral Calculus by Shanti Narain

References:
- Differential Equation by A.R.Forsyth
- Higher Engineering Mathematics by H.K. Dass
APPLIED PHYSICS - I (FIELDS AND WAVES)

Course Code: BTF 102  Credit Units: 03

Course Objective:
Aim of this course is to introduce the students to fundamentals of graduate level physics, which form the basis of all applied science and engineering

Course Contents:

Module I: Electrostatics
Brief introduction of Vectors, gradient of a scalar field, divergence and curl of vector field, Electric flux, Gauss’s law, Statements of Gauss divergence and Stokes theorem

Module II: Relativity
Michelson-Morley experiment, Inertial & non-inertial frames, Special theory of Relativity, Relativistic space-time transformation, Transformation of velocity, Variation of mass with velocity, Mass-energy equivalence

Module III: Oscillations & Waves
Simple harmonic motion – equation and energy conservation, superposition of two SHMs, Lissajous figures, damped and forced oscillations – equations, amplitude and frequency response, LCR Circuit, resonance, sharpness of resonance, equation of motion for plane progressive waves, superposition of waves

Module IV: Wave Nature of Light
Interference: Conditions of interference, division of wavefront, Fresnel’s biprism, division of amplitude, interference due to thin films, Newton’s rings
Diffraction: Fresnel and Fraunhofer diffraction, Fraunhofer diffraction at a single slit, Transmission grating and its resolving power.
Polarization: Birefringence, Nicol prism, Production and analysis of plane, circularly and elliptically polarized light, Half and quarter wave plates, Optical rotation

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Waves & oscillation, A. P. French
- Physics of waves, W. C. Elmore & M. A. Heald
- Introduction to Electrodynamics, D. J. Griffith
- Electrodynamics, Gupta, Kumar & Singh
- Optics, A. K. Ghatak
- Engineering Physics, Satya Prakash
Course Code: BTF 103  
Credit Units: 03

Course Objective:
Four basic sciences, Physics, Chemistry, Mathematics and Biology are the building blocks in engineering and technology. Chemistry is essential to develop analytical capabilities of students, so that they can characterize, transform and use materials in engineering and apply knowledge in their field. All engineering fields have unique bonds with chemistry whether it is Aerospace, Mechanical, Environmental and other fields the makeup of substances is always a key factor, which must be known. For electronics and computer science engineering, apart from the material, computer modeling and simulation knowledge can be inherited from the molecule designing. The upcoming field of technology like Nanotechnology and Biotechnology depends fully on the knowledge of basic chemistry. With this versatile need in view, course has been designed in such a way so that the student should get an overview of the whole subject starting from the very basic bonding mechanism to the application of materials.

Course Contents:

Module I: Chemical Bonding
Types of bond: Ionic, Covalent and Co-ordinate bond; Fajan’s rule; Hybridisation; H- bonding ; Valence bond and Molecular orbital theory for diatomic molecule.

Module II: Organic Mechanism
Electronegativity and dipole moment; Electron Displacement Effects: Inductive Effect; Mesomeric Effect; Electromeric Effects; Fission of covalent bonds; Intermediates of Organic reactions; Carbonium, Carbanion, Free Radical and Carbene; Types of organic reactions; Substitution, Elimination, Addition.

Module III: Instrumental method for Analysis
Introduction; Principles of spectroscopy; Law’s of Absorbance; IR: Principle Instrumentation; Application; UV: Principle, Instrumentation and Application; NMR Principle and Instrumentation; Application; Chromatography; GC: Principle, Instrumentation and Application; HPLC: Principle, Instrumentation and Application.

Module IV: Thermodynamics
Introduction; Terminology; First Law; Heat Capacity; Calculation of thermodynamic quantities; Adiabatic and Isothermal Process; Reversible and Irreversible Process; Second law of Thermodynamics; Standard State; Gilb’s Helmholtz equation; VantHoff Isotherm and Isochore; Maxwell Relation; Third law of Thermodynamics; Chemical Potential; Activity and Activity Coefficient; Coupled Reactions.

Module V: Chemical Equilibrium
Introduction ; Le Chatelier’s Principle; Equilibrium constant from Thermodynamic Constants; Acid-Base Concept; Weak acid and Weak base and their salts; Solubility Product; pH and pOH, Buffer Solution, Buffer Action.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Engineering Chemistry, Jain & Jain
- Engineering Chemistry, Shashi Chawla

References:
- Organic Mechanism, Morrison and Boyd
- Physical Chemistry, Puri Sharma and Pathania
- Organic Chemistry Vol-I , IL Finar
- Organic Chemistry Vol-II, IL Finar
- Physical Chemistry, Atkins Peter, Paula Julio
- A guide to mechanism in organic chemistry, Peter Sykes.
- Introduction to practical chemistry, K.K.Sharma
- Concise Inorganic chemistry, J.D. Lee
INTRODUCTION TO COMPUTERS

Course Objective:
The objective of this course module is to acquaint the students with the basics of computers system, its components, data representation inside computer and to get them familiar with various important features of procedure oriented programming language i.e. C.

Course Contents:

Module I: Introduction
Introduction to computer, history, von-Neumann architecture, memory system (hierarchy, characteristics and types), H/W concepts(I/O Devices), S/W concepts(System S/W & Application S/W, utilities). Data Representation: Number systems, character representation codes, Binary, octal, hexadecimal and their interconversions. Binary arithmetic, floating point arithmetic, signed and unsigned numbers, Memory storage unit.

Module II: Programming in C

Module III: Fundamental Features in C
C Statements, conditional executing using if, else, nesting of if, switch and break Concepts of loops, example of loops in C using for, while and do-while, continue and break. Storage types (automatic, register etc.), predefined processor, Command Line Argument.

Module IV: Arrays and Functions
One dimensional arrays and example of iterative programs using arrays, 2-D arrays Use in matrix computations. Concept of Sub-programming, functions Example of user defined functions. Function prototype, Return values and their types, calling function, function argument, function with variable number of argument, recursion.

Module V: Advanced features in C

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- “ANSI C” by E Balagurusamy.

References:
LIFE SCIENCES

Course Code: BTF 105 Credit Units: 02

Course Objective:
The objective of the course is to provide students an understanding of the very basic molecules of life-DNA,RNA, proteins and how these molecules, when form further complex molecules like carbohydrates, vitamins and lipids, then functioning of body takes place. Since technology is advancing in every field, emphasis is also given on the understanding of application of some biotechnological concepts used in our daily life like biofuels, biofertilizers. An introduction to the origin of earth, the environment-air, water and land, origin of life on Earth, how life evolved from a single cell, some environmental problems and measures to be taken to combat them.

Course Contents:

Module I: Cell Biology
Organization of cell (Inorganic-Water and Ions; Organic-Proteins, Lipids and Carbohydrates constituents) 
Physical structure of the cell-Brief introduction to the Cell Membrane, Cytoplasm and its Organelles (Nucleus, Mitochondria, Golgi, Endoplasmic Reticulum, Lysosomes, Peroxisomes, Ribosomes, Chloroplasts)
Cell cycle.

Module II: Introduction to Cell Physiology
Transport of substances through the cell membrane- Osmosis, Diffusion and its types, Active transport (Sodium-potassium pump) and Passive transport
Membrane potential, Measuring Membrane Potential, Action Potential
Electrocardiogram (ECG)
Electromyography (EMG)
Electroencephalography (EEG)

Module III: Environmental Biotechnology
Biosensors, Biochips and Biofilms
GMO’s and Biofertilizers
Biofuels
Gene Therapy, Stem cell and Nanobiomolecules
Bio Informatics- Introduction and Applications

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Fundamentals of Environmental Chemistry, G.S. Sodhi, Narosa Publishers
- Introduction to Environmental Pollution, B.K Sharma, H.Kaur, Goel Publishers.
- For Biochemistry, Styrier, Lalinger
- For Cell Biology, C B Pawar
ENVIRONMENT STUDIES

Course Code: BTF 106 Credit Units: 04

Course Objective:
The term environment is used to describe, in the aggregate, all the external forces, influences and conditions, which affect the life, nature, behaviour and the growth, development and maturity of living organisms. At present a great number of environment issues, have grown in size and complexity day by day, threatening the survival of mankind on earth. A study of environmental studies is quite essential in all types of environmental sciences, environmental engineering and industrial management. The objective of environmental studies is to enlighten the masses about the importance of the protection and conservation of our environment and control of human activities which has an adverse effect on the environment.

Course Contents:

Module I: The multidisciplinary nature of environmental studies
Definition, scope and importance
Need for public awareness

Module II: Natural Resources
Renewable and non-renewable resources:
Natural resources and associated problems
Forest resources: Use and over-exploitation, deforestation, case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems.
Mineral resources: Use and exploitation, environmental effects of extracting and using mineral resources, case studies.
Food resources: World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies.
Energy resources: Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies.
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.

Module III: 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, ocean estuaries)

Module IV: 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
Module V: Environmental Pollution
Definition
- Causes, 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 pollution
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.

Module VI: Social Issues and the Environment
From unsustainable to sustainable development
Urban problems and 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
Environmental 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

Module VII: Human Population and the Environment
Population growth, variation among nations
Population explosion – Family Welfare Programmes
Environment and human health
Human Rights
Value Education
HIV / AIDS
Women and Child Welfare
Role of Information Technology in Environment and Human Health
Case Studies

Module VIII: Field Work
Visit to a local area to document environmental assets-river / forest/ grassland/ hill/ mountain.
Visit to a local polluted site – Urban / Rural / Industrial / Agricultural
Study of common plants, insects, birds
Study of simple ecosystems-pond, river, hill slopes, etc (Field work equal to 5 lecture hours)

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>HA</th>
<th>S/V/Q</th>
<th>A</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>5</td>
<td>5</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:
- Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad 380 013, India, Email:mapin@icenet.net (R)
- Clark R.S., Marine Pollution, Clanderson Press Oxford (TB)
• De A.K., Environmental Chemistry, Wiley Eastern Ltd.
• Down to Earth, Centre for Science and Environment (R)
• Hawkins R.E., Encyclopedia of Indian Natural History, Bombay Natural History Society, Bombay (R)
• Mhaskar A.K., Matter Hazardous, Techno-Science Publication (TB)
• Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. (TB)
• Survey of the Environment, The Hindu (M)
• Townsend C., Harper J, and Michael Begon, Essentials of Ecology, Blackwell Science
• Trivedi R.K., Handbook of Environmental Laws, Rules Guidelines, Compliances and Standards, Vol I and II, Enviro Media (R)
• Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication (TB)
APPLIED PHYSICS LAB - I

Course Code: BTF 120  Credit Units: 01

Course Contents:

List of Experiments

1. To determine the wavelength of sodium light by Newton’s rings method.
2. To determine the dispersive power of the material of prism with the help of a spectrometer.
3. To determine the specific rotation of sugar by Bi-quartz or Laurent half shade polarimeter.
4. To determine the speed of ultrasonic waves in liquid by diffraction method.
5. To determine the width of a narrow slit using diffraction phenomena.
6. To determine the temperature coefficient of platinum wire, using a platinum resistance thermometer and a Callender & Grif/th’s bridge.
7. To determine the value of specific charge (ratio of e/m) of an electron by Thomson method.
8. To determine the internal resistance of Leclanche cell with the help of Potentiometer.
9. To determine the resistance per unit length of a Carey Foster’s bridge wire and also to find out the specific resistance of a given wire.
10. To plot graph showing the variation of magnetic field with distance along the axis of a circular coil carrying current, and hence estimate the radius of the coil.
11. To determine the value of acceleration due to gravity (“g”) in the laboratory using bar pendulum.
12. To determine the moment of inertia of a flywheel about its own axis of rotation.
13. To determine the density of material of the given wire with the help of sonometer

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
Course Contents:

1. Titration of phosphoric acid and sodium hydroxide solution using pH meter.
2. Verification and application of Beer’s Law.
3. Spectroscopic analysis of iron in water sample.
5. Determination of water modules of crystallization in Mohr’s salt.
6. (A) Determination of surface Tension of liquid.
   (B) Application of surface tension method in mixture analysis.
7. Application of distribution law in the determination of equilibrium constant.
8. Analysis of iron ore.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
PROGRAMMING IN C LAB

Course Code: BTF 122  Credit Units: 01

Course Contents:

SOFTWARE REQUIRED
Turbo C

Course Contents:

Module I
DOS commands

Module II
Creation of batch files

Module III
C program involving problems like finding the nth value of cosine series, Fibonacci series, Etc.

Module IV
C programs including user defined function calls

Module V
C programs involving pointers, and solving various problems with the help of those.

Module VI
File handling

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
ENGINEERING GRAPHICS LAB

Course Code: BTF 123 Credit Units: 01

Course Objective:
This course will provide students concepts on the drawings of different curves like straight line, parabola, ellipse etc. After completion of this course, students will be able to draw different figures manually and will be capable of using various instruments involved in drawings.

Course Contents:

Module I: General
Importance, Significance and scope of engineering drawing, Lettering, Dimensioning, Scales, Sense of proportioning, Different types of projections, Orthographic Projection, B.I.S. Specifications.

Module II: Projections of Point and Lines
Introduction of planes of projection. Reference and auxiliary planes, projections of points and Lines in different quadrants, traces, inclinations, and true lengths of the lines, projections on Auxiliary planes, shortest distance, intersecting and non-intersecting lines.

Module III: Planes other than the Reference Planes
Introduction of other planes (perpendicular and oblique), their traces, inclinations etc., Projections of points and lines lying in the planes, conversion of oblique plane into auxiliary Plane and solution of related problems.

Module IV: Projections of Plane Figures
Different cases of plane figures (of different shapes) making different angles with one or both reference planes and lines lying in the plane figures making different given angles (with one of both reference planes). Obtaining true shape of the plane figure by projection.

Module V: Projection of Solids
Simple cases when solid is placed in different positions, Axis faces and lines lying in the faces of the solid making given angles.

Module VI: Development of Surface
Development of simple objects with and without sectioning. Isometric Projection

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td>Attendance</td>
<td>Practical Record</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>

Text & References:
- PS Gill, Engineering Drawing, Kataria Publication
- ND Bhatt, Engineering Drawing, Charotar publications
- N Sidheshwar, Engineering Drawing, Tata McGraw Hill
- CL tanta, Mechanical Drawing, “Dhanpat Rai”

Note: TA – Teacher’s Assessment, LR – Lab Record, V - Viva
ENGLISH

Course Objective:
The course is intended to give a foundation of English Language. The literary texts are indented to help students to inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the prescribed literary texts. It will also help them to respond from different perspectives.

Course Contents:

Module I: Vocabulary
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

Module II: Essentials of Grammar – I
Articles
Parts of Speech
Tenses

Module III: Essentials of Grammar - II
Sentence Structure
Subject -Verb agreement
Punctuation

Module IV: Communication
The process and importance
Principles & benefits of Effective Communication

Module V: Spoken English Communication
Speech Drills
Pronunciation and accent
Stress and Intonation

Module VI: Communication Skills-I
Developing listening skills
Developing speaking skills

Module VII: Communication Skills-II
Developing Reading Skills
Developing writing Skills

Module VIII: Written English communication
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

Module IX: Short Stories
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K.Narayan
Glory at Twilight, Bhabani Bhattacharya

Module X: Poems
All the Worlds a Stage Shakespeare
To Autumn Keats
O! Captain, My Captain. Walt Whitman
Where the Mind is Without Fear Rabindranath Tagore
Psalm of Life H.W. Longfellow
Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>A</th>
<th>CT</th>
<th>HA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>05</td>
<td>15</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.

* 30 hrs Programme to be continued for Full year
BEHAVIOURAL SCIENCE - I
(UNDERSTANDING SELF FOR EFFECTIVENESS)

Course Code: BTF 143 Credit Units: 01

Course Objective:
This course aims at imparting:
Understanding self & process of self exploration
Learning strategies for development of a healthy self esteem
Importance of attitudes and its effective on personality
Building Emotional Competence

Course Contents:

Module I: Self: Core Competency
Understanding of Self
Components of Self – Self identity
Self concept
Self confidence
Self image

Module II: Techniques of Self Awareness
Exploration through Johari Window
Mapping the key characteristics of self
Framing a charter for self
Stages – self awareness, self acceptance and self realization

Module III: Self Esteem & Effectiveness
Meaning and Importance
Components of self esteem
High and low self esteem
Measuring your self esteem

Module IV: Building Positive Attitude
Meaning and nature of attitude
Components and Types of attitude
Importance and relevance of attitude

Module V: Building Emotional Competence
Emotional Intelligence – Meaning, components, Importance and Relevance
Positive and Negative emotions
Healthy and Unhealthy expression of emotions

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:
- Organizational Behaviour, Davis, K.
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
• J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
FRENCH - I

Course Code: BTF 144  Credit Units: 02

Course Objective:
To familiarize the students with the French language
- with the phonetic system
- with the syntax
- with the manners
- with the cultural aspects

Course Contents:

Module A: pp. 01 to 37: Unités 1, 2, Unité 3 Objectif 1, 2
Only grammar of Unité 3: objectif 3, 4 and 5

Contenu lexical: Unité 1: Découvrir la langue française : (oral et écrit)
1. se présenter, présenter quelqu’un, faire la connaissance des
2. autres, formules de politesse, rencontres
3. dire/interroger si on comprend
4. Nommer les choses

Unité 2: Faire connaissance
1. donner/demander des informations sur une personne, premiers contacts, exprimer ses goûts et ses préférences
2. Parler de soi: parler du travail, de ses activités, de son pays, de sa ville.

Unité 3: Organiser son temps
1. dire la date et l’heure

Contenu grammatical:
1. organisation générale de la grammaire
2. article indéfini, défini, contracté
3. nom, adjectif, masculin, féminin, singulier et pluriel
4. négation avec « de », "moi aussi", "moi non plus"
5. interrogation : Inversion, est-ce que, qui, que, quoi, qu’est-ce que, où, quand, comment, quel(s), quelle(s)
Interro-négatif : réponses : oui, si, non
6. pronom tonique/disjoint- pour insister après une préposition
7. futur proche

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre : Campus: Tome 1
Course Code: BTF 145  Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany

Course Contents:

Module I: Introduction
Self introduction: heissen, kommen, wohnen, lernen, arbeiten, trinken, etc.
All personal pronouns in relation to the verbs taught so far.
Greetings: Guten Morgen!, Guten Tag!, Guten Abend!, Gute Nacht!, Danke sehr!, Danke!, Vielen Dank!, (es tut mir Leid!),
Hallo, wie geht’s?: Danke gut!, sehr gut!, prima!, ausgezeichnet!, Es geht!, nicht so gut!, so so!, miserabel!

Module II: Interviewspiel
To assimilate the vocabulary learnt so far and to apply the words and phrases in short dialogues in an interview – game for self introduction.

Module III: Phonetics
Sound system of the language with special stress on Dipthongs

Module IV: Countries, nationalities and their languages
To make the students acquainted with the most widely used country names, their nationalitie and the language spoken in that country.

Module V: Articles
The definite and indefinite articles in masculine, feminine and neuter gender. All Vegetables, Fruits, Animals, Furniture, Eatables, modes of Transport

Module VI: Professions
To acquaint the students with professions in both the genders with the help of the verb “sein”.

Module VII: Pronouns
Simple possessive pronouns, the use of my, your, etc.
The family members, family Tree with the help of the verb “to have”

Module VIII: Colours
All the color and color related vocabulary – colored, colorful, colorless, pale, light, dark, etc.

Module IX: Numbers and calculations – verb “kosten”
The counting, plural structures and simple calculation like addition, subtraction, multiplication and division to test the knowledge of numbers.
Wie viel kostet das?

Module X: Revision list of Question pronouns
W – Questions like who, what, where, when, which, how, how many, how much, etc.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice
Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
SPANISH – I

Course Code:  BTF 146  Credit Units: 02

Course Objective:
To enable students acquire the relevance of the Spanish language in today’s global context, how to greet each other. How to present / introduce each other using basic verbs and vocabulary

Course Contents:

Module I
A brief history of Spain, Latin America, the language, the culture…and the relevance of Spanish language in today’s global context.
Introduction to alphabets

Module II
Introduction to ‘Saludos’ (How to greet each other. How to present / introduce each other).
Goodbyes (despedidas)
The verb *llamarse* and practice of it.

Module III
Concept of Gender and Number
Months of the years, days of the week, seasons. Introduction to numbers 1-100, Colors, Revision of numbers and introduction to ordinal numbers.

Module IV
Introduction to *SER* and *ESTAR* (both of which mean To Be). Revision of ‘Saludos’ and ‘Llamarse’. Some adjectives, nationalities, professions, physical/geographical location, the fact that spanish adjectives have to agree with gender and number of their nouns. Exercises highlighting usage of *Ser* and *Estar*.

Module V
Time, demonstrative pronoun (Este/esta, Aquel/aquella etc)

Module VI
Introduction to some key AR /ER/IR ending regular verbs.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- Español, En Directo I A
- Español Sin Fronteras
JAPANESE - I

Course Code: BTF 147  Credit Units: 02

Course Objective:
The course is designed to enable the students to learn the basic rules of grammar and Japanese language to be used in daily life that will later help them to strengthen their language.

Course Contents:

Module I: Salutations
Self introduction, Asking and answering to small general questions

Module II: Cardinal Numbers
Numerals, Expression of time and period, Days, months

Module III: Tenses
Present Tense, Future tense

Module IV: Prepositions
Particles, possession, Forming questions

Module V: Demonstratives
Interrogatives, pronoun and adjectives

Module VI: Description
Common phrases, Adjectives to describe a person

Module VII: Schedule
Time Table, everyday routine etc.

Module VIII: Outings
Going to see a movie, party, friend’s house etc.

Learning Outcome
➢ Students can speak the basic language describing above mentioned topics

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments and role-plays will support classroom teaching

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
• Teach yourself Japanese

References:
• Shin Nihongo no kiso 1
Course Code: BTF 148  
Credit Units: 02

Course Objective:
There are many dialects spoken in China, but the language which will help you through wherever you go is Mandarin, or Putonghua, as it is called in Chinese. The most widely spoken forms of Chinese are Mandarin, Cantonese, Gan, Hakka, Min, Wu and Xiang. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Show pictures, dialogue and retell.
Getting to know each other.
Practicing chart with Initials and Finals. (CHART – The Chinese Phonetic Alphabet Called “Hanyu Pinyin” in Mandarin Chinese.)
Practicing of Tones as it is a tonal language.
Changes in 3rd tone and Neutral Tone.

Module II
Greetings
Let me Introduce
The modal particle “ne”.
Use of Please ‘qing” – sit, have tea ………….. etc.
A brief self introduction – Ni hao ma? Zaijian!
Use of “bu” negative.

Module III
Attributives showing possession
How is your Health? Thank you
Where are you from?
A few Professions like – Engineer, Businessman, Doctor, Teacher, Worker.
Are you busy with your work?
May I know your name?

Module IV
Use of “How many” – People in your family?
Use of “zhe” and “na”.
Use of interrogative particle “shenme”, “shui”, “ma” and “nar”.
How to make interrogative sentences ending with “ma”.
Structural particle “de”.
Use of “Nin” when and where to use and with whom. Use of guixing.
Use of verb “zuo” and how to make sentences with it.

Module V
Family structure and Relations.
Use of “you” – “mei you”.
Measure words
Days and Weekdays.
Numbers.
Maps, different languages and Countries.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice
Text & References:

- “Elementary Chinese Reader Part I” Lesson 1-10
APPLIED MATHEMATICS – II

Course Code: BTF 201

Credit Units: 04

Course Objective:
The knowledge of Mathematics is necessary for a better understanding of almost all the Engineering and Science subjects. Here our intention is to make the students acquainted with the concept of basic topics from mathematics, which they need to pursue their Engineering degree in different disciplines.

Course Contents:

Module I: Linear Algebra

Module II: Complex Number
Definition of Complex Number, Equality, Conjugate and Modulus of a Complex Number, Polar form of a Complex Number, De-Moivre’s Theorem, Roots of a Complex Number, Exponential and Circular function of a Complex Number, Hyperbolic Functions and their inverses.

Module III: Vector Calculus
Scalar and vector field, Gradient, Divergence and Curl, Directional Derivative, Evaluation of a Line Integral, Green’s theorem in plain (without proof), Stoke’s theorem (without proof) and Gauss Divergence theorem (without proof).

Module IV: Probability and Statistics
Frequency Distribution, Arithmetic Mean, Median, Partition Values, Mode, Variance and Standard Deviation, Curve Fitting, Principle of least squares, Linear regression.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Higher Engineering Mathematics by H.K. Dass
APPLIED PHYSICS - II

Course Code: BTF 202
Credit Units: 03

Course Objective:
Aim of this course is to introduce the students to fundamentals of graduate level physics, which form the basis of all applied science and engineering

Course Contents:

Module I: Wave Mechanics
de-Broglie matter waves, wave nature of particles, phase and group velocity, Heisenberg uncertainty principle, wave function and its physics interpretation, Operators, expectation values. Time dependent & time independent Schrödinger wave equation for free & bound states, square well potential (rigid wall). Concept of step potential.

Module II: Atomic Physics
Vector atom model, LS and j-j coupling, Zeeman effect & Paschen-Back effect, Bragg’s law, X-ray spectra and energy level diagram, Laser – Einstein coefficient, population inversion, condition of light amplification, He-Ne and Ruby laser

Module III: Solid State Physics
Sommerfield’s free electron theory of metals, Fermi energy, Energy bands in solids, physics of semi-conductors, doping, intrinsic and extrinsic semiconductors, Depletion layer, characteristics of PN junction, Forward and reverse baising, Breakdown voltage, Superconductivity, Meissner effect, Introduction to Nanomaterials

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Concept of Modern Physics, A. Beiser
- Applied Physics II, Agarawal & Goel
- Solid State Physics, S. O. Pallai
- Physics of Atom, Wehr & Richards
APPLIED CHEMISTRY - II

Course Code: BTF 203
Credit Units: 03

Course Objective:
Four basic sciences, Physics, Chemistry, Mathematics and Biology are the building blocks in engineering and technology. Chemistry is essential to develop analytical capabilities of students, so that they can characterize, transform and use materials in engineering and apply knowledge in their field. All engineering fields have unique bonds with chemistry whether it is Aerospace, Mechanical, Environmental and other fields the makeup of substances is always a key factor, which must be known. For electronics and computer science engineering, apart from the material, computer modeling and simulation knowledge can be inherited from the molecule designing. The upcoming field of technology like Nanotechnology and Biotechnology depends fully on the knowledge of basic chemistry. With this versatile need in view, course has been designed in such a way so that the student should get an overview of the whole subject starting from the very basic bonding mechanism to the application of materials.

Course Contents:

Module I: Water
Hardness of Water; Boiler Feed Water; Scale and Sludge; Softening of Water; External and Internal Treatment of Boiler Water; Domestic Water Treatment; Domestic Water Treatment; Desalination of Brackish Water; Chemical Analysis of Water; Dissolved O₂ (BOD, COD); Estimation of Free Chlorine; TDS.

Module II: Lubricants
Introduction; Mechanism of Lubrication; Types of Lubricants; Chemical structure related to Lubrication; Properties of lubricants; Viscosity and Viscosity Index; Iodine Value; Aniline Point; Emulsion number; Flash Point; Fire Point; Drop Point; Cloud Point; Pour Point. Selection of Lubricants.

Module III: Fuel
Introduction; Characteristics of good Fuel ; Calorific value; Bomb Calorimeter; Proximate and Ultimate analysis of coal; Carbonization of coal; Gasification and Liquification of coal; Fischer Tropsch and Bergius Process; Water Gas and Producer Gas

Module IV: Polymers
Introduction; Polymerization: Addition and Condensation Polymerization; Thermosetting and Thermoplastic Polymers; Molecular Weight of Polymer; Rubber, Plastic and Fiber; Preparation, Properties and uses of PMMA, Polyester, Epoxy Resins and Bakelite, Silicone Polymers.

Module V: Corrosion

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/ Seminar/ Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Engineering Chemistry-Jain & Jain
- Engineering Chemistry- Shashi Chawla

References:
- Engineering Chemistry -Dara
- Engineering Chemistry -Sunita Ratan
- Polymer Science - Gowariker, Viswanathan Sreedhar
- Corrosion Engineering – Fontenna and Greene
OBJECT ORIENTED PROGRAMMING IN C++

Course Code: BTF 204 Credit Units: 03

Course Objective:
The objective of this module is to introduce object oriented programming. To explore and implement the various features of OOP such as inheritance, polymorphism, Exceptional handling using programming language C++. After completing this course student can easily identify the basic difference between the programming approaches like procedural and object oriented.

Course Contents:

Module I: Introduction

Module II: Classes and Objects
Abstract data types, Object & classes, attributes, methods, C++ class declaration, Local Class and Global Class, State identity and behaviour of an object, Local Object and Global Object, Scope resolution operator, Friend Functions, Inline functions, Constructors and destructors, instantiation of objects, Types of Constructors, Static Class Data, Array of Objects, Constant member functions and Objects, Memory management Operators.

Module III: Inheritance
Inheritance, Types of Inheritance, access modes – public, private & protected, Abstract Classes, Ambiguity resolution using scope resolution operator and Virtual base class, Aggregation, composition vs classification hiiérarchies, Overriding inheritance methods, Constructors in derived classes, Nesting of Classes.

Module IV: Polymorphism
Polymorphism, Type of Polymorphism – Compile time and runtime, Function Overloading, Operator Overloading (Unary and Binary) Polymorphism by parameter, Pointer to objects, this pointer, Virtual Functions, pure virtual functions.

Module V: Strings, Files and Exception Handling

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- “Object Oriented Programming with C++” By E. Balagurusamy.

References:
ELECTRICAL SCIENCE

Course Code: BTF 205 Credit Units: 02

Course Objective:
The objective of the course is to provide a brief knowledge of Electrical Engineering to students of all disciplines. This Course includes some theorems related to electrical, some law’s related to flow of current, voltages, basic knowledge of Transformer, basic knowledge of electromagnetism, basic knowledge of electrical network.

Course Contents:

Module I: Basic Electrical Quantities

Module II: Network Analysis Techniques & Theorems

Module III: Alternating Current Circuits
Peak, Average and RMS values for alternating currents, Power calculation: reactive power, active power, Complex power, power factor, impedance, reactance, conductance, susceptance Resonance: series Resonance, parallel resonance, basic definition of Q factor & Band-width.

Module IV: Transformers
Basic Transformer Operation principle, Construction, Voltage relations, current relations, Linear circuit models, open circuit test, short circuit test, Transformer Efficiency.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- R.J. Smith, R.C. Dorf: Circuits, devices and Systems
- B.L. Thareja: Electrical Technology : Part -1 & 2
- V.Deltoro: Electrical Engineering fundamentals
- Schaum’s Series: Electrical Circuits
APPLIED PHYSICS LAB - II

Course Code: BTF 220  Credit Units: 01

Course Contents:

List of Experiments

1. To determine the wavelength of prominent lines of mercury spectrum using plane transmission grating.
2. To determine the thickness of a given wire by Wedge method.
3. To determine the wavelength of He-Ne laser light using single slit.
4. To determine the frequency of an electrically maintained tuning fork by Melde’s method.
5. To study the variation of magnetic field along the axis of Helmholtz coil and to find out reduction factor.
6. To draw the V – I characteristics of a forward and reverse bias PN junction diode.
7. To determine the frequency of AC mains using sonometer.
8. To determine the energy band-gap of Germanium crystal using four probes method.
9. To draw V – I characteristics of a photocell and to verify the inverse square law of radiation.
10. To determine the acceleration due to gravity ("g") using Keter’s reversible pendulum.
11. To study the characteristics of photo voltaic cell (Solar cell).

Examination Scheme:

<table>
<thead>
<tr>
<th>Class Test (Practical Based)</th>
<th>Mid Term Viva</th>
<th>Attendance</th>
<th>Major Experiment</th>
<th>Minor Experiment/Spotting</th>
<th>Practical Record</th>
<th>Viva</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>15</td>
<td>10</td>
<td>05</td>
<td>35</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>EE</td>
<td>10</td>
<td>05</td>
<td>35</td>
<td>15</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

APPLIED CHEMISTRY LAB - II

Course Code: BTF 221
Credit Units: 01

Course Contents:

1. Determining the viscosity index of lubricating oil by using Redwood viscometer.
2. Determining the flash point and fire point of lubricating oil.
5. Synthesis of Urea Formaldehyde resin.
6. Determination of Molecular weight of Polymer.
7. Determination of Ion exchange capacity of a region.
9. Determination of Iodine value in water.

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Attendance</td>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>Major Experiment</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>Minor Experiment/Spotting</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Practical Record</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
SOFTWARE REQUIRED
Turbo C++

- Creation of objects in programs and solving problems through them.
- Different use of private, public member variables and functions and friend functions.
- Use of constructors and destructors.
- Operator overloading
- Use of inheritance in and accessing objects of different derived classes.
- Polymorphism and virtual functions (using pointers).
- File handling.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
ELECTRICAL SCIENCE LAB

Course Code: BTF 223
Credit Units: 01

Course Contents:

List of Experiments

1. To verify KVL & KCL in the given network.
2. To verify Superposition Theorem.
3. To verify Maximum Power Transfer Theorem.
4. To verify Reciprocity Theorem.
5. To determine and verify $R_{Th}$, $V_{Th}$, $R_{N}$, $I_{N}$ in a given network.
6. To perform open circuit & short circuit test on a single-phase transformer.
7. To study transient response of a given RLC Circuit.
8. To perform regulation, ratio & polarity test on a single-phase transformer.
9. To measure power & power factor in a three phase circuit by two wattmeter method.
10. To measure power & power factor in a three phase load using three ammeter & three voltmeter method.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
Course Objective:
The course is intended to give a foundation of English Language. The literary texts are intended to help students to
inculcate creative & aesthetic sensitivity and critical faculty through comprehension, appreciation and analysis of the
prescribed literary texts. It will also help them to respond from different perspectives.

Course Contents:

Module I: Vocabulary
Use of Dictionary
Use of Words: Diminutives, Homonyms & Homophones

Module II: Essentials of Grammar - I
Articles
Parts of Speech
Tenses

Module III: Essentials of Grammar - II
Sentence Structure
Subject - Verb agreement
Punctuation

Module IV: Communication
The process and importance
Principles & benefits of Effective Communication

Module V: Spoken English Communication
Speech Drills
Pronunciation and accent
Stress and Intonation

Module VI: Communication Skills - I
Developing listening skills
Developing speaking skills

Module VII: Communication Skills - II
Developing Reading Skills
Developing writing Skills

Module VIII: Written English communication
Progression of Thought/ideas
Structure of Paragraph
Structure of Essays

Module IX: Short Stories
Of Studies, by Francis Bacon
Dream Children, by Charles Lamb
The Necklace, by Guy de Maupassant
A Shadow, by R.K. Narayan
Glory at Twilight, Bhabani Bhattacharya

Module X: Poems
All the Worlds a Stage Shakespeare
To Autumn Keats
O! Captain, My Captain. Walt Whitman
Where the Mind is Without Fear Rabindranath Tagore
Psalm of Life H.W. Longfellow
Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>A</th>
<th>CT</th>
<th>HA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>05</td>
<td>15</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Madhulika Jha, Echoes, Orient Long Man
- Successful Communications, Malra Treece (Allyn and Bacon)
- Effective Technical Communication, M. Ashraf Rizvi.
BEHAVIOURAL SCIENCE - II
(PROBLEM SOLVING AND CREATIVE THINKING)

Course Code: BTF 243 Credit Units: 01

Course Objective:
To enable the students:
Understand the process of problem solving and creative thinking.
Facilitation and enhancement of skills required for decision-making.

Course Contents:

Module I: Thinking as a tool for Problem Solving
What is thinking: The Mind/Brain/Behaviour
Critical Thinking and Learning:
Making Predictions and Reasoning
Memory and Critical Thinking
Emotions and Critical Thinking
Thinking skills

Module II: Hindrances to Problem Solving Process
Perception
Expression
Emotion
Intellect
Work environment

Module III: Problem Solving
Recognizing and Defining a problem
Analyzing the problem (potential causes)
Developing possible alternatives
Evaluating Solutions
Resolution of problem
Implementation
Barriers to problem solving:
- Perception
- Expression
- Emotion
- Intellect
- Work environment

Module IV: Plan of Action
Construction of POA
Monitoring
Reviewing and analyzing the outcome

Module V: Creative Thinking
Definition and meaning of creativity
The nature of creative thinking
- Convergent and Divergent thinking
- Idea generation and evaluation (Brain Storming)
- Image generation and evaluation
- Debating
The six-phase model of Creative Thinking: ICEDIP model

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer
Text & References:

- Michael Steven: How to be a better problem solver, Kogan Page, New Delhi, 1999
- Geoff Petty: How to be better at creativity; Kogan Page, New Delhi, 1999
- Phil Lowe Koge Page: Creativity and Problem Solving, New Delhi, 1996
Course Code: BTF 244
Credit Units: 02

Course Objective:
To enable the students to overcome the fear of speaking a foreign language and take position as a foreigner speaking French.
To make them learn the basic rules of French Grammar.

Course Contents:
Module B: pp. 47 to 75 Unité 4, 5

Contenu lexical: Unité 3: Organiser son temps
1. donner/demander des informations sur un emploi du temps, un horaire SNCF
   – Imaginer un dialogue
2. rédiger un message/ une lettre pour …
   i) prendre un rendez-vous/ accepter et confirmer/ annuler
   ii) inviter/accepter/refuser
3. Faire un programme d’activités
   imaginer une conversation téléphonique/un dialogue
   Propositions- interroger, répondre

Unité 4: Découvrir son environnement
1. situer un lieu
2. s’orienter, s’informer sur un itinéraire.
3. Chercher, décrire un logement
4. connaître les rythmes de la vie

Unité 5: s’informer
1. demander/donner des informations sur un emploi du temps passé.
2. donner une explication, exprimer le doute ou la certitude.
3. découvrir les relations entre les mots
4. savoir s’informer

Contenu grammatical: 1. Adjectifs démonstratifs
2. Adjectifs possessifs/exprimer la possession à l’aide de :
   i. « de » ii. A+nom/pronom disjoint
3. Conjuguaison pronominale – négative, interrogative -
   construction à l'infinitif
4. Impératif/exprimer l’obligation/l’interdiction à l’aide de « il
   faut…. »/ «il ne faut pas… »
5. passé composé
6. Questions directes/indirectes

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre : Campus: Tome 1
GERMAN – II

Course Code: BTF 245
Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Grammar to consolidate the language base learnt in Semester I

Course Contents:

Module I: Everything about Time and Time periods
Time and times of the day.
Weekdays, months, seasons.
Adverbs of time and time related prepositions

Module II: Irregular verbs
Introduction to irregular verbs like to be, and others, to learn the conjugations of the same, (fahren, essen, lessen, schlafen, sprechen und ähnliche).

Module III: Separable verbs
To comprehend the change in meaning that the verbs undergo when used as such
Treatment of such verbs with separable prefixes

Module IV: Reading and comprehension
Reading and deciphering railway schedules/school time table
Usage of separable verbs in the above context

Module V: Accusative case
Accusative case with the relevant articles
Introduction to 2 different kinds of sentences – Nominative and Accusative

Module VI: Accusative personal pronouns
Nominative and accusative in comparison
Emphasizing on the universal applicability of the pronouns to both persons and objects

Module VII: Accusative prepositions
Accusative propositions with their use
Both theoretical and figurative use

Module VIII: Dialogues
Dialogue reading: ‘In the market place’
‘At the Hotel’

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
SPANISH – II

Course Code: BTF 246 Credit Units: 02

Course Objective:
To enable students acquire more vocabulary, grammar, Verbal Phrases to understand simple texts and start describing any person or object in Simple Present Tense.

Course Contents:

Module I
Revision of earlier modules.

Module II
Some more AR/ER/IR verbs. Introduction to root changing and irregular AR/ER/IR ending verbs

Module III
More verbal phrases (eg, Dios Mio, Que lastima etc), adverbs (bueno/malo, muy, mucho, bastante, poco). Simple texts based on grammar and vocabulary done in earlier modules.

Module IV
Possessive pronouns

Module V
Writing/speaking essays like my friend, my house, my school/institution, myself….descriptions of people, objects etc, computer/internet related vocabulary

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras
Course Code: BTF 247  Credit Units: 02

Course Objective:
To enable the students to converse in the language with the help of basic particles and be able to define the situations and people using different adjectives.

Course Contents:

Module I: Verbs
Transitive verbs, intransitive verbs

Module II: More prepositions
More particles, articles and likes and dislikes.

Module III: Terms used for instructions
No parking, no smoking etc.

Module IV: Adverbs
Different adverbial expression.

Module V: Invitations and celebrations
Giving and receiving presents,
Inviting somebody for lunch, dinner, movie and how to accept and refuse in different ways

Module VI: Comprehension’s
Short essay on Family, Friend etc.

Module VII: Conversations
Situational conversations like asking the way, At a post office, family

Module VIII: Illness
Going to the doctor, hospital etc.

Learning Outcome
➢ Students can speak the language describing above-mentioned topics.

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments.
➢ Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
• Teach yourself Japanese

References:
• Shin Nihongo no kiso 1
Course Code: BTF 248  Credit Units: 02

Course Objective:
Chinese is a tonal language where each syllable in isolation has its definite tone (flat, falling, rising and rising/falling), and same syllables with different tones mean different things. When you say, “ma” with a third tone, it mean horse and “ma” with the first tone is Mother. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Practice reading aloud
Observe Picture and answer the question.
Tone practice.
Practice using the language both by speaking and by taking notes.
Introduction of basic sentence patterns.
Measure words.
Glad to meet you.

Module II
Where do you live?
Learning different colors.
Tones of “bu”
Buying things and how much it costs?
Dialogue on change of Money.
More sentence patterns on Days and Weekdays.
How to tell time. Saying the units of time in Chinese. Learning to say useful phrases like – 8:00, 11:25, 10:30 P.M. everyday, afternoon, evening, night, morning 3:58, one hour, to begin, to end …… etc.

Module III
Use of words of location like-li, wais hang, xia
Furniture – table, chair, bed, bookshelf… etc.
Description of room, house or hostel room.. eg what is placed where and how many things are there in it?
Review Lessons – Preview Lessons.
Expression ‘yao”, “xiang” and “yaoshi” (if).
Days of week, months in a year etc.
I am learning Chinese. Is Chinese difficult?

Module IV
Counting from 1-1000
Use of “chang-chang”.
Making an Inquiry – What time is it now? Where is the Post Office?
Days of the week. Months in a year.
Use of Preposition – “zai”, “gen”.
Use of interrogative pronoun – “duoshao” and “ji”.
“What’s”??? Sweater etc is it?
Different Games and going out for exercise in the morning.

Module V
The verb “qu”
– Going to the library issuing a book from the library
– Going to the cinema hall, buying tickets
– Going to the post office, buying stamps
– Going to the market to buy things.. etc
– Going to the buy clothes …. Etc.
Hobby. I also like swimming.
Comprehension and answer questions based on it.

**Examination Scheme:**

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Weightage (%)</strong></td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation  
I – Interaction/Conversation Practice

**Text & References:**

- “Elementary Chinese Reader Part I” Lesson 11-20
# CELL BIOLOGY

**Course Code:** BTF 301  
**Credit Units:** 03

## Course Objective:
Cell biology plays a central role to connect the different fields of biotechnology, which is highly interdisciplinary. It incorporates elements of biology, maths, physics and chemistry with combination of computers and electronics. The object of the present course is to understand the structure and function of the cellular and sub cellular components of cells and tissues with the help of recent techniques.

## Course Contents:

### Module I
The cell theory, precellular evolution, Cell cycle - Molecular events and model systems, Regulators of cell-cycle

### Module II
Various cell organelles and their organisation, structure and function

### Module III
Introduction to the organs of cellular locomotion (cilia, flagella, microfilaments and microtubules)

### Module IV
Membrane Transport: Ionic channels in plants and animals in correlation with diseases.

### Module V
Signal Transduction: Introduction, Mechanisms, Cell-Cell signaling, Amplification of signals, Biotic and abiotic signals

### Module VI
Cancer – Alteration of cell cycle, Forms of cancer with examples, genes involved in onset of cancer, cancer drugs. Apoptosis – Model of *C. elegans*, describing genes involved in cellular differentiation, Signal, pathways for apoptosis

## Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

## Text & References:

### Text:
- Essential Cell Biology : An Introduction to the Molecular Biology of the Cell, B. Alberts, D. Bray, A. Johnson,
- Cell and Molecular Biology by Gerald Karp, John Wiley and Sons Inc.

### References:
- Cell in Development and Inheritance by E.B. Wilson, Macmilian  
- Developmental Biology by S.F. Gilbert, Sinauer Associates Inc.  
- Cell and Molecular Biology by DeRobertis, B.I. Publication Pvt. Ltd.
BIOCHEMISTRY – I

Course Code: BTF 302  Credit Units: 03

Course Objective:
The course aims on understanding of the relationships between structure and function in the major classes of biopolymers. It augurs understanding on central metabolic process and the role of enzymes in modulating pathways. The theoretical background of biochemical systems helps to interpret the results of laboratory experiments.

Course Contents:

Module I

Module II
Carbohydrates -Sugars; Polysaccharides; Glycoproteins -structure and function.

Module III
Carbohydrate metabolism - glycolytic pathway, fermentation, Pentose phosphate pathway, Citric acid cycle, Electron transport chain and oxidative phosphorylation, Glycogen breakdown and synthesis, control of glycogen metabolism, glycogen storage and its disease, Gluconeogenesis, glyoxylate pathway, Biosynthesis of Oligosaccharides and glycoproteins

Module IV
Lipids - classification, structure and function. Lipids and biological membranes. Transport across cell membranes; Lipid linked proteins and lipoproteins.

Module V
Lipid metabolism - Lipid digestion, absorption and transport, fatty acid oxidation, ketone bodies, fatty acid biosynthesis, regulation of fatty acid metabolism. Cholesterol and Arachidonic Acid metabolism

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Biochemistry by L. Stryer, W.H. Freeman and Company

References:
- Biochemical calculations by I.H. Segal, John Wiley and Sons
- Devlin’s Textbook of Biochemistry with Clinical correlations, John Wiley and Sons Inc.
- Tools of Biochemistry by T.G. Cooper, John Wiley and Sons Inc.
MICROBIOLOGY

Course Code: BTF 303  Credit Units: 03

Course Objective:
The course imparts the knowledge of different types of microorganisms that are invisible to our naked eyes. Discovery origin and evaluation of different forms of bacteria, fungi, protozoa and viruses constitute the basics of biotechnology.

Course Contents:

Module I
Fundamentals of microbiology - Discovery of the microbial world, controversy over spontaneous generation. Principles of microbial nutrition, Culture media, Pure culture techniques. Morphology, arrangement and detailed anatomy of bacterial cell.

Module II
Control of microorganisms - Physical agents, chemical agents, antibiotics and other chemotherapeutic agents

Module III
Microbial nutrition and growth - The definition of growth, mathematical expression of growth, growth curve, measurement of growth and growth yields, synchronous growth, continuous culture, culture collection and maintenance of cultures.

Module IV
Overview of metabolic diversity among microorganisms – Respiration, Photosynthesis in microorganisms; Calvin cycle; Chemolithotrophy; nitrate and sulfate reduction; methanogenesis and acetogenesis; nitrogen fixation.

Module V
Microbial diversity - Bacteria: Purple and Green bacteria, Cyanobacteria, Spirilla, Spirochetes, Lactic acid and propionic acid bacteria, Acetic acid bacteria, Endospore forming rods and cocci; Mycobacteria; Rickettsia, Chlamydia, Mycoplasma. Viruses: structure, classification and reproduction of bacterial, plant and animal viruses Virioids and prions. General account of Fungi, Algae, Protozoa and Archaea

Module VI

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td></td>
<td>15</td>
<td>5</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- General Microbiology by R.Y. Stanier, J.L. Ingraham, M.L. Wheelis and P.R. Painter, Macmillian

References:
- Principles of Microbiology by R.M. Atlas. Publisher Wm C. Brown
- The microbes – An Introduction to their Nature and Importance by P.V. Vandenmark and B.L. Batzing, Benjamin Cummings.
- The Microbial World by Roger Y. Stanier, Prentice Hall
- Microbiology by Tortora, Funke and Chase, Benjamin & Cummings
- Principles of Fermentation Technology by Salisbury, Whitaker and Hall, Aditya Books Pvt. Ltd.
- Industrial Microbiology by Casida, New Age International
- Industrial Microbiology by Prescott and Dunn, C.B.S. Publishers
BASICS OF COMPUTER SYSTEMS AND PROGRAMMING

Course Code: BTF 304 Credit Units: 04

Course Objective:
The aim of this course is two-folds. First to introduce the students to the basic concepts of computer science, and second to provide the students with a practical ability in scientific programming. The course will teach programming in C covering the standard elements of the language.

Course Contents:

Module I
C++ programming language – Classes and objects, Constructors and Destructors, Inheritance, Pointers, Virtual Functions, Polymorphism, Console IO operations, Data Files, Exception handling

Module II
Data Structures: - Linked list, doubly linked list, circular link list; stack implementation using array and linked list; Queue implementation using array & linked list; priority Queue

Module III
Traversal: - Preorder, Postorder, inorder; Tree: Binary tree, m-way tree, AVL tree,

Module IV
Sorting- Bubble sort, Insertion sort, Quick Sort, Selection sort, Merge sort; Searching: Linear search, Binary search

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Let Us C++ by KanetKar, BPB
- Algorithm and Data Structure, RS Salaria

References:
- A comprehensive guide to c++ by Aklecha, BPB
- Introduction to object oriented Programming and C++ by KanetKar;BPB
INTERNET TECHNOLOGIES

Course Code: BTF 305  Credit Units: 02

Course Objective:
During this course, students learn basics of Internet and to use it for research/and educational purposes. They will be accustomed to web pages and will be able to browse using different browsers and different searching strategies. They will also be aware about the issues like safety, privacy, and exchanging information over electronic media etc.

Course Contents:

Module I
Introduction to Internet, its history, the working of Internet, components of Internet, Web sites and WebPages, Major protocols that make up the Web, the URL and the Domain Name System,

Module II
Web browsers, plug-ins, Active X, multimedia, A brief about Web programming languages and functions, Real-Time communication, Blogs and RSS
Browse using different browsers, Search Engines and searching the web, different searching strategies.

Module III
Awareness about cyber-crime, safety, privacy, and exchanging information over electronic media etc., Strategies for evaluating resources found on the Internet.

Module IV
Computer network, Types of computer networks, Network Topology, Different types of network topology with their advantages and disadvantages.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Bioinformatics: Databases and Systems, Stanley Letovsky
- Networking for Dummies by Lowe, Doug.

References:
- Introduction to Bioinformatics by Teresa Attwood, David Parry-Smith,
- Bioinformatics: Sequence, Structure and Databanks: A Practical Approach (The Practical Approach Series, 236), Des Higgins (Editor), Willie Taylor
- Bioinformatics: A Biologist's Guide to Biocomputing and the Internet, Stuart M. Brown
- All about computers for dummies by Gookin Dass
- Bioinformatics: Sequence and Genome Analysis, David W. Mount.
CELL BIOLOGY LAB

Course Code: BTF 320  Credit Units: 01

Course Contents:

Module I
Microscopy: Bright field, phase contrast and fluorescence microscopy.

Module II
Microtomy

Module III
Instrumental methods for Cell Biology

Module IV
Subcellular fractionation and marker enzymes

Module V
Histochemical techniques

Module VI
Mitosis and Meiosis

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
BIOCHEMISTRY - I AND MICROBIOLOGY LAB

Course Code: BTF 321
Credit Units: 02

Course Contents:

Module I
Colorimetric determination of pK.

Module II
Reactions of sugars.

Module III
Isolation, purity determination and quantitation of DNA.

Module IV
Quantitation of proteins.

Module V
Preparation of liquid and solid media. Isolation and maintenance of organisms by plating, streaking and serial dilution. Slants and slab cultures. Storage of micro-organisms.

Module VI
Growth-growth curve -measurement of bacterial population by turbidometry and dilution methods. Effect of temperature, pH and carbon and nitrogen sources. Microscopic examination of bacteria, yeast and molds and study of organisms by gram stain, acid fast stain and staining for spores.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
COMPUTERS LAB - I

Course Code: BTF 322  Credit Units: 02

Course Contents:

Module I
OOPS: Implementation of classes using array and pointers; Implementation of constructor, destructor, Inheritance, polymorphism, Files

Module II
Array and linked list implementation of stack, queue

Module III
Implementation of different sorting and searching methods

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term</td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td>Viva</td>
<td>Practical Record</td>
</tr>
<tr>
<td>Attendance</td>
<td>Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>05</td>
</tr>
<tr>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
INTERNET TECHNOLOGIES LAB

Course Code: BTF 323  Credit Units: 01

Course Contents:

- Different types of search engines, searching the web, various strategies for efficient searching.
- Using web-based tools, working with Biological sequences:
  a) Conversions of sequence from one form to another (e.g., nucleic acid sequence to amino acid sequence etc.)
  b) Finding out different parameters of a given sequence (e.g., composition, molecular weight, complement, reverse complement etc.).
- Referencing in Scientific literature and their practical usage.
- Format conversion of Biological sequences.
- Pubmed and relevant literature databases: Features and usage.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>Attendance</td>
</tr>
<tr>
<td>Attendance</td>
<td>05</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
TERM PAPER

A term (or research) paper is primarily a record of intelligent reading in several sources on a particular subject. The students will choose the topic at the beginning of the session in consultation with the faculty assigned. The progress of the paper will be monitored regularly by the faculty. At the end of the semester the detailed paper on the topic will be submitted to the faculty assigned. The evaluation will be done by Board of examiners comprising of the faculties.

GUIDELINES FOR TERM PAPER

The procedure for writing a term paper may consists of the following steps:
1. Choosing a subject
2. Finding sources of materials
3. Collecting the notes
4. Outlining the paper
5. Writing the first draft
6. Editing & preparing the final paper

1. Choosing a Subject
The subject chosen should not be too general.

2. Finding Sources of materials
a) The material sources should be not more than 10 years old unless the nature of the paper is such that it involves examining older writings from a historical point of view.
b) Begin by making a list of subject-headings under which you might expect the subject to be listed.
c) The sources could be books and magazines articles, news stories, periodicals, scientific journals etc.

3. Collecting the notes
Skim through sources, locating the useful material, then make good notes of it, including quotes and information for footnotes.
a) Get facts, not just opinions. Compare the facts with author's conclusion.
b) In research studies, notice the methods and procedures, results & conclusions.
c) Check cross references.

4. Outlining the paper
a) Review notes to find main sub-divisions of the subject.
b) Sort the collected material again under each main division to find sub-sections for outline so that it begins to look more coherent and takes on a definite structure. If it does not, try going back and sorting again for main divisions, to see if another general pattern is possible.

5. Writing the first draft
Write the paper around the outline, being sure that you indicate in the first part of the paper what its purpose is. You may follow the following:
a) statement of purpose
b) main body of the paper
c) statement of summary and conclusion
Avoid short, bumpy sentences and long straggling sentences with more than one main ideas.

6. Editing & Preparing the final Paper
a) Before writing a term paper, you should ensure you have a question which you attempt to answer in your paper. This question should be kept in mind throughout the paper. Include only information/details/analyses of relevance to the question at hand. Sometimes, the relevance of a particular section may be clear to you but not to your readers. To avoid this, ensure you briefly explain the relevance of every section.
b) Read the paper to ensure that the language is not awkward, and that it "flows" properly.
c) Check for proper spelling, phrasing and sentence construction.
d) Check for proper form on footnotes, quotes, and punctuation.
Check to see that quotations serve one of the following purposes:

- Show evidence of what an author has said.
- Avoid misrepresentation through restatement.
- Save unnecessary writing when ideas have been well expressed by the original author.
- Check for proper form on tables and graphs. Be certain that any table or graph is self-explanatory.

Term papers should be composed of the following sections:

1. Title page
2. Table of contents
3. Introduction
4. Review
5. Discussion & Conclusion
6. References
7. Appendix

Generally, the introduction, discussion, conclusion and bibliography part should account for a third of the paper and the review part should be two thirds of the paper.

**Discussion**

The discussion section either follows the results or may alternatively be integrated in the results section. The section should consist of a discussion of the results of the study focusing on the question posed in the research paper.

**Conclusion**

The conclusion is often thought of as the easiest part of the paper but should by no means be disregarded. There are a number of key components which should not be omitted. These include:

- summary of question posed
- summary of findings
- summary of main limitations of the study at hand
- details of possibilities for related future research

**References**

From the very beginning of a research project, you should be careful to note all details of articles gathered. The bibliography should contain ALL references included in the paper. References not included in the text in any form should NOT be included in the bibliography.

The key to a good bibliography is consistency. Choose a particular convention and stick to this.

**Conventions**

- Monographs

- Edited Volumes
  - [(eds.) is used when there is more than one editor; and (ed.) where there is only one editor. In German the abbreviation used is (Hrsg.) for Herausgeber].

- Edited Articles

- Journal Articles

- Electronic Book

- Electronic Journal Articles
  - Watts, S. (2000) Teaching talk: Should students learn 'real German'? [HTML document]. German as a Foreign

Other Websites

Unpublished Papers

Unpublished Theses/ Dissertations

Appendix
The appendix should be used for data collected (e.g. questionnaires, transcripts, ...) and for tables and graphs not included in the main text due to their subsidiary nature or to space constraints in the main text.

Assessment Scheme:

Continuous Evaluation
40%
(Based on abstract writing, interim draft, general approach, research orientation, readings undertaken etc.)

Final Evaluation
60%
(Based on the organization of the paper, objectives/ problem profile/ issue outlining, comprehensiveness of the research, flow of the idea/ ideas, relevance of material used/ presented, outcomes vs. objectives, presentation/ viva etc.)
COMMUNICATION SKILLS - I

Course Code: BTF 341  Credit Units: 01

Course Objective:
To form written communication strategies necessary in the workplace

Course Contents:

Module I: Introduction to Writing Skills
Effective Writing Skills
Avoiding Common Errors
Paragraph Writing
Note Taking
Writing Assignments

Module II: Letter Writing
Types
Formats

Module III
Memo
Agenda and Minutes
Notice and Circulars

Module IV: Report Writing
Purpose and Scope of a Report
Fundamental Principles of Report Writing
Project Report Writing
Summer Internship Reports

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>CAF</th>
<th>V</th>
<th>GD</th>
<th>GP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Business Communication, Raman – Prakash, Oxford
- Creative English for Communication, Krishnaswamy N, Macmillan
- Textbook of Business Communication, Ramaswami S, Macmillan
- Working in English, Jones, Cambridge
- Effective Writing, Withrow, Cambridge
- Writing Skills, Coe/Rycroft/Ernest, Cambridge
- Welcome!, Jones, Cambridge
Course Objective:
This course provides practical guidance on
Enhancing personal effectiveness and performance through effective interpersonal communication
Enhancing their conflict management and negotiation skills

Course Contents:

Module I: Interpersonal Communication: An Introduction
Importance of Interpersonal Communication
Types – Self and Other Oriented
Rapport Building – NLP, Communication Mode
Steps to improve Interpersonal Communication

Module II: Behavioural Communication
Meaning and Nature of behavioural communication
Persuasion, Influence, Listening and Questioning
Guidelines for developing Human Communication skills
Relevance of Behavioural Communication for personal and professional development

Module III: Interpersonal Styles
Transactional Analysis
Life Position/Script Analysis
Games Analysis
Interact ional and Transactional Styles

Module IV: Conflict Management
Meaning and nature of conflicts
Styles and techniques of conflict management
Conflict management and interpersonal communication

Module V: Negotiation Skills
Meaning and Negotiation approaches (Traditional and Contemporary)
Process and strategies of negotiations
Negotiation and interpersonal communication

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- Julia T. Wood. Interpersonal Communication everyday encounter
- Harvard Business School, Effective Communication: United States of America
- Foster John, Effective Writing Skills: Volume-7, First Edition 2000, Institute of Public Relations (IPR)
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
Course Objective:
- To provide the students with the know-how
- To master the current social communication skills in oral and in written.
- To enrich the formulations, the linguistic tools and vary the sentence construction without repetition.

Course Contents:

Module B: pp. 76 – 88 Unité 6

Module C: pp. 89 to103 Unité 7

Contenu lexical: Unité 6: se faire plaisir
1. acheter : exprimer ses choix, décrire un objet (forme, dimension, poids et matière)
2. payer
3. parler de la nourriture, deux façons d’exprimer la quantité, commander un repas au restaurant
4. parler des différentes occasions de faire la fête

Unité 7: Cultiver ses relations
1. maîtriser les actes de la communication sociale courante (Salutations, présentations, invitations, remerciements)
2. annoncer un événement, exprimer un souhait, remercier, s’excuser par écrit.
3. caractériser une personne (aspect physique et caractère)

Contenu grammatical:
1. accord des adjectifs qualificatifs
2. articles partitifs
3. Négations avec de, ne…rien/persone/plus
4. Questions avec combien, quel…
5. expressions de la quantité
6. ne…plus/toujours - encore
7. pronoms compléments directs et indirects
8. accord du participe passé (auxiliaire « avoir ») avec l’objet direct
9. Impératif avec un pronom complément direct ou indirect
10. construction avec « que » - Je crois que/ Je pense que/ Je sais que

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre : Campus: Tome 1
GERMAN - III

Course Code: BTF 345  Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany.

Course Contents:

Module I: Modal verbs
Modal verbs with conjugations and usage
Imparting the finer nuances of the language

Module II: Information about Germany (ongoing)
Information about Germany in the form of presentations or “Referat” – neighbors, states and capitals, important cities and towns and characteristic features of the same, and also a few other topics related to Germany.

Module III: Dative case
Dative case, comparison with accusative case
Dative case with the relevant articles
Introduction to 3 different kinds of sentences – nominative, accusative and dative

Module IV: Dative personal pronouns
Nominative, accusative and dative pronouns in comparison

Module V: Dative prepositions
Dative preposition with their usage both theoretical and figurative use

Module VI: Dialogues
In the Restaurant,
At the Tourist Information Office,
A telephone conversation

Module VII: Directions
Names of the directions
Asking and telling the directions with the help of a roadmap

Module VIII: Conjunctions
To assimilate the knowledge of the conjunctions learnt indirectly so far

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazzo et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
SPANISH – III

Course Code: BTF 346 Credit Units: 02

Course Objective:
To enable students acquire knowledge of the Set/definite expressions (idiomatic expressions) in Spanish language and to handle some Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules
Set expressions (idiomatic expressions) with the verb Tener, Poner, Ir....
Weather

Module II
Introduction to Gustar…and all its forms. Revision of Gustar and usage of it

Module III
Translation of Spanish-English; English-Spanish. Practice sentences.
How to ask for directions (using estar)
Introduction to IR + A + INFINITIVE FORM OF A VERB

Module IV
Simple conversation with help of texts and vocabulary
En el restaurante
En el instituto
En el aeropuerto

Module V
Reflexives

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras -Nivel Elemental
Course Code: BTF 347  Credit Units: 02

Course Objective:
To enable the students to converse in the language with the help of basic verbs and to express themselves effectively and narrate their everyday short encounters. Students are also given projects on Japan and Japanese culture to widen their horizon further.
Note: The Japanese script is introduced in this semester.

Course Contents:

Module I: Verbs
Different forms of verbs: present continuos verbs etc

Module II
More Adverbs and adverbial expressions

Module III: Counters
Learning to count different shaped objects

Module IV: Tenses
Past tense, Past continuous tense.

Module V: Comparison
Comparative and Superlative degree

Module VI: Wishes and desires
Expressing desire to buy, hold, possess. Usage in negative sentences as well. Comparative degree, Superlative degree.

Module VII: Appointment
Over phone, formal and informal etc.

Learning Outcome
➢ Students can speak the language and can describe themselves and situations effectively
➢ They also gain great knowledge in terms of Japanese lifestyle and culture, which help them at the time of placements.

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments.
➢ Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
➢ Teach yourself Japanese

References:
➢ Shin Nihongo no kiso 1
CHINESE – III

Course Code: BTF 348 Credit Units: 02

Course Objective:
Foreign words are usually imported by translating the concept into Chinese, the emphasis is on the meaning rather than the sound. But the system runs into a problem because the underlying name of personal name is often obscure so they are almost always transcribed according to their pronunciation alone. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
Introduction of written characters.
Practice reading aloud
Practice using the language both by speaking and by taking notes.
Character writing and stroke order

Module II
Measure words
Position words e.g. inside, outside, middle, in front, behind, top, bottom, side, left, right, straight.
Directional words – beibian, xibian, nanbian, dongbian, zhongjian.
Our school and its different building locations.
What game do you like?
Difference between “hii” and “neng”, “keyi”. 

Module III
Changing affirmative sentences to negative ones and vice versa
Human body parts.
Not feeling well words e.g. ; fever, cold, stomach ache, head ache.
Use of the modal particle “le”
Making a telephone call
Use of “jiu” and “cal” (Grammar portion)
Automobiles e.g. Bus, train, boat, car, bike etc.
Traveling, by train, by airplane, by bus, on the bike, by boat.. etc.

Module IV
The ordinal number “di”
“Mei” the demonstrative pronoun e.g. mei tian, mei nian etc.
use of to enter to exit
Structural particle “de” (Compliment of degree).
Going to the Park.
Description about class schedule during a week in school.
Grammar use of “li” and “cong”.
Comprehension reading followed by questions.

Module V
Persuasion-Please don’t smoke.
Please speak slowly
Praise – This pictorial is very beautiful
Opposites e.g. Clean-Dirty, Little-More, Old-New, Young-Old, Easy-Difficult, Boy-Girl, Black-White, Big-Small,
Slow-Fast … etc.
Talking about studies and classmates
Use of “it doesn’t matter”
Enquiring about a student, description about study method.
Grammar: Negation of a sentence with a verbal predicate.
Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader Part I, Part-2” Lesson 21-30
BIOCHEMISTRY - II

Course Code: BTF 401  Credit Units: 03

Course Objective:
The course aims on understanding of the relationships between structure and function in the major classes of biopolymers. It augurs understanding on central metabolic process and the role of enzymes in modulating pathways. The theoretical background of biochemical systems helps to interpret the results of laboratory experiments.

Course Contents:

Module I
Proteins: Amino acids and peptides - classification, chemical reactions and physical properties.
Nucleic acids - Nitrogenous bases, nucleotides, types, structure and properties of nucleic acids.

Module II
Biosynthesis of proteins

Module III
Amino acid metabolism - Amino acid deamination, urea cycle, amino acids as biosynthetic precursors, amino acid biosynthesis, Specialized Products of Amino Acids, Nitrogen fixation

Module IV
Nucleotide Metabolism - structure and metabolism of purines and pyrimidines, biosynthesis of nucleotide coenzymes; Heme and Porphyrin Metabolism

Module V
Enzymes: Introduction and scope, Nomenclature, Mechanism of Catalysis, Regulation of enzyme activity, Enzyme Kinetics: Single substrate steady state kinetics; King-Altman's method; Inhibitors and activators; Multi-substrate systems; Effect of pH and temperature; Allosteric enzymes.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:

References:
- Biochemical calculations by I.H. Segal. John Wiley and Sons
- Devlin’s Textbook of Biochemistry with Clinical correlations. John Wiley and Sons Inc.
- Tools of Biochemistry by T.G. Cooper. John Wiley and Sons Inc.
Course Code: BTF 402  Credit Units: 03

Course Objective:
The aim is to extend understanding of the molecular mechanisms via which genetic information are stored, expressed and transmitted among generations.

Course Contents:

Module I: DNA Replication
Prokaryotic and Eukaryotic DNA replication, Mechanism of DNA Replication, Enzymes and accessory proteins involved in DNA replication

Module II: Transcription
Prokaryotic transcription, Eukaryotic transcription, RNA polymerase, General and specific transcription factors, Regulatory elements and mechanism of transcription regulation

Module III: Modifications in RNA
5’-cap formation, transcription termination, 3’-end processing and polyadenylation, Splicing, Editing, Genetic Code and codon usage;

Module IV: Translation
Prokaryotic and Eukaryotic translation, Mechanisms of initiation, elongation and termination, regulation of translation.

Module V
Transcriptional gene silencing, post transcriptional gene silencing, antisense technology, co-suppression, RNA interference

Module VI: Protein Targeting
Synthesis of secretory and membrane proteins, Import into nucleus, mitochondria, chloroplast and peroxisomes,

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:

References:
- Genome by T.A. Brown. John Willey & Sons Inc.
- Molecular Biology of the Cell by B. Alberts, D. Bray, J. Lewis, M. Raff, K. Roberts and J.D. Watson, Garland Publishing
- Introduction to Practical Molecular Biology by P.D. Dabre. John Wiley and Sons Inc.
COMPUTERS - II

Course Code: BTF 403  Credit Units: 03

Course Objective:
The objective of this course is to make students well versed with concepts and implementation of database systems, and visual basic, with an emphasis on bioinformatics applications.

Course Contents:

Section A: Database Concept with Oracle

Module I
Introduction to Database, RDBMS Vs DBMS, Normalisation.

Module II
Introduction to SQL, DDL, DML and DCL statements, Integrity Constraint.
Functions(Aggregate, Character, date), Views, joins, Sub Queries with Any and All, Sequences, data Dictionary, SQL reports, generating SQL statements, Introduction to LOBS Controlling the user access.

Module III
Introduction to Database Programming With PL/SQL, Control Flow Statements (IF Statements and Loops), Cursors(Implicit and Explicit), Function and Procedures, data base Triggers, Packages, Exception Handling

Section B: Programming With Visual basic 6.0.

Module I
Introduction to Visual basic, Features, Control flow statements, Event handling (click, lost focus, Got focus, Change, load etc.), array, Control Array, Creating Function and Procedures, modules

Module II
Insert, update, delete and navigation of records using DAO and ADO.

Module III
Introduction to controls like file, Directory, drive, timer, ComboBox, List Box, Progress bar, Creation of MDI form, menu, toolbar, status bar, Tabstrip control.

Module IV
Advanced Concepts: Chart control, Flex grid control, mapi control. Packing and deployment, Data Project, DLL creation, ActiveX

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- SQL, PL/SQL – The programming Language by Ivan Bayross: BPB
- Visual basic to advanced by dasgupta, Publisher: BPB

References:
- Oracle programming with Visual basic by Snowdon
- Introduction to Oracle 9i by Thomas, Publisher: BPB
- Visual basic Developers Guide to ADO by Russel, Publisher: BPB
GENETICS

Course Code: BTF 404
Credit Units: 03

Course Objective:
The objective of the course is to focus on the basic principles of genetics incorporating the concepts of classical, molecular and population genetics. Compilation is required for recent advances in genetic principles for strong foundation in Biotechnology.

Course Contents:

Module I
The science of genetics -introduction, history, classical and molecular genetics, role of genetics in medicine, agriculture and society.

Module II

Module III
Simple sequence repeat loci, Southern and fluorescence in situ hybridization for genome analysis; RFLP, RAPD and AFLP analysis, molecular markers linked to disease resistance genes; Applications of RFLP in forensic, disease prognosis, genetic counseling, pedigree, varietal etc. Animal trafficking and poaching, germplasm maintenance, taxonomy and biodiversity.

Module IV
Mechanism of genetic change -mutation and mutagenesis

Module V
Concept of gene – classical and modern, pseudoallelism, position effect, intragenic crossing over & complementation (cistron, recon & nutron) Benzer’s work on r II locus in T2 bacteriophage

Module VI: Extranuclear Inheritance in Higher Plants.
Overview of the mitochondrial and chloroplast Genome with suitable examples.

Module VII: Genetics of Population
Hardy- Weinburg Law and its deviations.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:

References:
- Genetics by M. W. Strickberger. Prentice Hall College Division
- Genetics by P.J.Russell. Benjamin/Cummings
- Genetics by R. Goodenough. International Thomson Publishing
- Introduction to Genetic Analysis by A.J. F. Griffiths. W.H. Freeman and Company
- Principles of Genetics by D.P. Snustad & M.J. Simmons. John Wiley and Sons Inc.
- Genetics by P.K. Gupta. Rastogi Publication
STATISTICS

Course Code: BTF 405 Credit Units: 03

Course Objective:
The course aims to develop competency and expertise in the application of statistical methods applied to biological data obtained in experimental techniques, methodology and the safe laboratory practice.

Course Contents:

Module I
The nature and scope of statistics, Introduction to Biostatistics

Module II
Preliminary concepts (Averages and dispersion), Probability theory, Bay’s theorem, theoretical distributions (Binomial, Normal, Poisson) and their properties, WLLN, CLT

Module III
Introduction of few distribution (Rectangular, Exponential, Beta distribution of first and second kind, Gamma), Moments, Sampling techniques of attributes, estimation theory, test of significance for large and small samples.

Module IV
The Chi-Square Test (Standard error, Null hypothesis, Confidence limits, Degree of freedom, Fisher’s F-test (analysis of variance)

Module V
Curve-fitting by method of least square, correlation, rank correlation and regression.

Module VI
Introduction to Demography and vital statistics, analysis of time series, interpolation and extrapolation, Markov chains

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Fundamental of Biostatistics by Bernard Rosner. Oxford University Press

References:
- Introduction to Probability Theory by P.G. Hoel. Houghton Mifflin College
- Mathematical Statistics by H.C. Saxena. S. Chand & Company
- Biometry – Case study by Nicholas Lange and Louise Ryan. John Wiley & Sons
Course Code: BTF 406  Credit Units: 02

Course Objective:
Chemical biology is that branch of life science, which deals with the study and manipulation of biological systems through the application of chemical techniques and tools. It differs from the more traditional disciplines of chemistry and biology in its emphasis on integrating a wider series of experimental techniques, ranging from synthetic organic chemistry, to biochemistry, to structural, molecular, and cellular biology. Chemical biology has historical and philosophical roots in medicinal chemistry, supramolecular chemistry (particularly host-guest chemistry), bioorganic chemistry, pharmacology, genetics, biochemistry and metabolic engineering.

Course Contents:

Module I: Principles of chemical biology
Chemistry of carbohydrates, proteins and nucleic acids, strategies for identifying the cellular target of physiologically active natural products (paclitaxel, vancomycin), chemical aspects of signal transduction

Module II: Chemical reactions in living systems
Introduction to enzyme chemistry, Group transfer reactions, Substitutions, Carboxylation and decarboxylation, Isomerases, Eliminations and additions, Redox reactions (1), Redox reactions (2), Aldol and Claisen Reactions, One-carbon transfer reactions, Rearrangements

Module III: Structural chemical biology
Purine biosynthesis, polyamide biosynthesis, thiamine biosynthesis, vitamin E biosynthesis, proteases

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Chemical Biology by H. Gobind Khorana
- Chemical Biology: A practical course, Herbert Waldmann, Petra Janning, Wiley-VCH
- Foundations of Chemical Biology, C.M. Dobson, J.A. Gerrard, A.J. Pratt, Oxford Chemistry Primers
- Innovations in Chemical Biology, Sener Bilge, Springer
- Chemical biology by Stuart L. Shreiber, Tarun Kapoor, Gunther Wess, Wiley-VCH.

References:
BIOCHEMISTRY LAB - II

Course Code: BTF 420  Credit Units: 01

Course Contents:

Module I
Proteins: Separation of proteins by SDS-PAGE

Module II
Enzyme: Enzyme activity study of serum alkaline phosphotase

Module III
Nucleic Acid:
Biochemical estimation of DNA
Biochemical estimation of RNA
Separation of DNA on Agrose gel.

Module IV
Lipids:
Blood Cholesterol estimation.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
MOLECULAR BIOLOGY AND GENETICS LAB

Course Code: BTF 421
Credit Units: 02

Course Contents:

Module I
Preparation of DNA: genomic, Plasmid

Module II
Isolation of RNA: total RNA and mRNA

Module III
Bacterial transformation.

Module IV
Karyotype-discussion of human genetic disorders - Staining of plant cells to study chromosomes.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
Course Code: BTF 422  Credit Units: 02

Course Contents:

Module I
Creation of table, Insert, Update, Delete records, Implementing the integrity constraint: Primary Key, Not null, Foreign Key, Check, Unique. Using Implicit function: Date, Character and Aggregate Function, Sub queries.

Module II
Implementing Views, joins: Equi, Inner and Outer, creation of sequences, SQL reports. Generating SQL statements. User management :( Create user, alter user, object privileges, system, Privileges,grant, revoke,Role)

Module III
PL/SQL: Control Statements, Writing programs using Cursor, Implementing Functions and Procedures, Implementing data base Triggers and Packages. PL/SQL Tables.

Module IV
Visual basic: Form Creations, Working with controls from tool bar. Data base programming with the ADO and DAO. Implementing Chart control, Flex grid, Modules, Functions, package and deployment of the project, Reports using data project, File Handling

Module V
ActiveX creation, DLL creation

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
COMMUNICATION SKILLS - II

Course Code: BTF 441  Credit Units: 01

Course Objective:
To teach the participants strategies for improving academic reading and writing. Emphasis is placed on increasing fluency, deepening vocabulary, and refining academic language proficiency.

Course Contents:

Module I: Social Communication Skills
Small Talk
Conversational English
Appropriateness
Building rapport

Module II: Context Based Speaking
In general situations
In specific professional situations
Discussion and associated vocabulary
Simulations/Role Play

Module III: Professional Skills
Presentations
Negotiations
Meetings
Telephony Skills

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>CAF</th>
<th>V</th>
<th>GD</th>
<th>GP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Essential Telephoning in English, Garside/Garside, Cambridge
- Working in English, Jones, Cambridge
- Business Communication, Raman –Prakash, Oxford
- Speaking Personally, Porter-Ladousse, Cambridge
- Speaking Effectively, Jermy Comfort, et.al, Cambridge
- Business Communication, Raman –Prakash, Oxford
BEHAVIOURAL SCIENCE - IV
(RELATIONSHIP MANAGEMENT)

Course Code: BTF 443  Credit Units: 01

Course Objective:
To understand the basis of interpersonal relationship
To understand various communication style
To learn the strategies for effective interpersonal relationship

Course Contents:

Module I: Understanding Relationships
Importance of relationships
Role and relationships
Maintaining healthy relationships

Module II: Bridging Individual Differences
Understanding individual differences
Bridging differences in Interpersonal Relationship – TA
Communication Styles

Module III: Interpersonal Relationship Development
Importance of Interpersonal Relationships
Interpersonal Relationships Skills
Types of Interpersonal Relationships

Module IV: Theories of Interpersonal Relationships
Theories: Social Exchange, Uncertainty Reduction Theory
Factors Affecting Interpersonal Relationships
Improving Interpersonal Relationships

Module V: Impression Management
Meaning & Components of Impression Management
Impression Management Techniques (Influencing Skills)
Impression Management Training-Self help and Formal approaches

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- Julia T. Wood. Interpersonal Communication everyday encounter
- Harvard Business School, Effective Communication: United States of America
- Foster John, Effective Writing Skills: Volume-7, First Edition 2000, Institute of Public Relations (IPR)
- Beebe, Beebe and Redmond; Interpersonal Communication, 1996; Allyn and Bacon Publishers.
FRENCH - IV

Course Code: BTF 444  Credit Units: 02

Course Objective:
To enable students:
• To develop strategies of comprehension of texts of different origin
• To present facts, projects, plans with precision

Course Contents:

Module C:  pp. 104 – 139: Unités 8, 9

Contenu lexical: Unité 8: Découvrir le passé
1. parler du passé, des habitudes et des changements.
2. parler de la famille, raconter une suite d’événements/préciser leur date et leur durée.
3. connaître quelques moments de l’histoire

Unité 9: Entreprendre
1. faire un projet de la réalisation: (exprimer un besoin, préciser les étapes d’une réalisation)
2. parler d’une entreprise
3. parler du futur

Contenu grammatical:
1. Imparfait
2. Pronom « en »
3. Futur
4. Discours rapporté au présent
5. Passé récent
6. Présent progressif

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
• le livre à suivre : Campus: Tome 1
GERMAN - IV

Course Code: BTF 445 Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany.
Introduction to Advanced Grammar Language and Professional Jargon

Course Contents:

Module I: Present perfect tense
Present perfect tense, usage and applicability
Usage of this tense to indicate near past
Universal applicability of this tense in German

Module II: Letter writing
To acquaint the students with the form of writing informal letters.

Module III: Interchanging prepositions
Usage of prepositions with both accusative and dative cases
Usage of verbs fixed with prepositions
Emphasizing on the action and position factor

Module IV: Past tense
Introduction to simple past tense
Learning the verb forms in past tense
Making a list of all verbs in the past tense and the participle forms

Module V: Reading a Fairy Tale
Comprehension and narration
  - Rotkäppchen
  - Froschprinzessin
  - Die Fremdsprache

Module VI: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module VII: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module VIII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja , Deutsch Interessant- 1, 2 & 3
• Rosa-Maria Dallapiazza et al., Tangram Aktuell A1/1,2
• Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
Course Code: **BTF 446**  
Credit Units: **02**

**Course Objective:**  
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

**Course Contents:**

**Module I**  
Revision of earlier semester modules  
Introduction to Present Continuous Tense (Gerunds)

**Module II**  
Translation with Present Continuous Tense  
Introduction to Gustar, Parecer, Apetecer, doler

**Module III**  
Imperatives (positive and negative commands of regular verbs)

**Module IV**  
Commercial/business vocabulary

**Module V**  
Simple conversation with help of texts and vocabulary  
En la recepcion del hotel  
En el restaurante  
En la agencia de viajes  
En la tienda/supermercado

**Examination Scheme:**

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation  
I – Interaction/Conversation Practice

**Text & References:**

- **Español Sin Fronteras (Nivel – Elemental)**
JAPANESE - IV

Course Code: BTF 447  
Credit Units: 02

Course Objective:
To enable the students to comfortably interact using basic Japanese.

Note: Teaching is done in roman as well as Japanese script, students will be taught katankana (another form of script) in this semester i.e. to be able to write all the foreign words in Japanese.

Course Contents:

Module I
Comparison using adjectives, making requests

Module II
Seeking permission

Module III
Practice of conversations on:
Visiting people, Party, Meetings, After work, At a ticket vending machine etc

Module IV
Essays, writing formal letters

Learning Outcome
➢ Students can speak the language describing above-mentioned topics.

Methods of Private study /Self help
➢ Handouts, audio-aids, and self-do assignments, role-plays.
➢ Students are also encouraged to attend Japanese film festival and other such fairs and workshops organized in the capital from time to time.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
➢ Teach yourself Japanese

References:
➢ Shin Nihongo no kiso 1
CHINESE – IV

Course Code: BTF 448  Credit Units: 02

Course Objective:
How many characters are there? The early Qing dynasty dictionary included nearly 50,000 characters the vast majority of which were rare accumulated characters over the centuries. An educate person in China can probably recognize around 6000 characters. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Dialogue Practice
Observe picture and answer the question
Pronunciation and intonation
Character writing and stroke order.
Electronic items

Module II
Traveling – The Scenery is very beautiful
Weather and climate
Grammar question with – “bu shi …. Ma?”
The construction “yao … le” (Used to indicate that an action is going to take place)
Time words “yiqian”, “yiwei” (Before and after).
The adverb “geng”.

Module III
Going to a friend house for a visit meeting his family and talking about their customs.
Fallen sick and going to the Doctor, the doctor examines, takes temperature and writes prescription.
Aspect particle “guo” shows that an action has happened some time in the past.
Progressive aspect of an actin “zhengzai” Also the use if “zhe” with it.
To welcome someone and to see off someone …. I cant go the airport to see you off… etc.

Module IV
Shipment. Is this the place to checking luggage?
Basic dialogue on – Where do u work?
Basic dialogue on – This is my address
Basic dialogue on – I understand Chinese
Basic dialogue on – What job do u do?
Basic dialogue on – What time is it now?

Module V
Basic dialogue on – What day (date) is it today?
Basic dialogue on – What is the weather like here.
Basic dialogue on – Do u like Chinese food?
Basic dialogue on – I am planning to go to China.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Elementary Chinese Reader, Part-2” Lesson 31-38
STRUCTURAL BIOLOGY

Course Objective:
The course aims to provide an understanding of the principles and applications of proteins, enzymes and nucleic acids for their role in biochemical pathway as well as interactions among themselves.

Course Contents:

Module I: Chemistry of amino acids and peptides (side chain structure and function in protein folding and functionality)
- Secondary structure of proteins - helices, sheets, loops and turns; Structural and functional proteins. Tertiary structure of proteins, homo and hetero-dimers, trimers and tetramers; forces governing protein-protein interactions; open tertiary structure; Classification of proteins; Structure and function of an antibody; structure of hemoglobin, muscle proteins; Sequence and structural motifs in proteins.

Module II: Protein-ligand interactions
- Lock and key versus handshake mechanism of substrate recognition; structural basis of recognition; reaction mechanisms of enzymes, G-Protein coupled receptors.

Module III: Protein solubility, protein stability and stabilization
- Salting in and salting out, Parameters affecting; enthalpic and entropic stabilization, mutations increasing stability, helix capping; Native, partially denatured and denatured proteins; Protein denaturation, Physical and chemical denaturants; Refolding

Module IV: DNA structure
- Covalent structure of DNA, base pairing, hydrogen bonding, DNA melting and annealing, difference between AT and GC pairing, DNA models, The Watson Crick model; Crystal structure of B-DNA, major and minor grooves, dyad symmetry, base pair stacking, propellor twist, A and Z- DNA, triple stranded DNA, telomeric sequences and structure, G-quartcts, palindromic and tandem sequences, Base pair flipping and DNA bulges, DNA methylation; Protein-DNA interactions; drug-DNA interactions

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Introduction to Protein Structure by C. Branden and J Tooze. Garland Publishing Company
- Biochemistry by R.H. Abeles, P.A. Frey and W.A. Jencks. Jones and Bartlett

References:
- Essentials of Molecular Biology by D. Freifelder. Jones and Bartlett Publications
- Genes VII by B. Lewin. Oxford University Press
- Protein Structure by M. Perutz. Oxford University Press
- Proteins (Structures and Molecular Properties) by T.E. Creighton. Publishers : W.H. Freeman and Company
- Database Annotation in Molecular Biology by Arthur M. Lesk
- From Genes to Clones by E.L. Winnacker
- Genes & Genomes by M.S. Paul Berg
- Structure and Machanism in Protein Science by Alan Fersht
Course Objective:
The aim is to provide practical training in bioinformatics methods including accessing the major public sequence databases, use of the different computational tools to find sequences, analysis of protein and nucleic acid sequences by various software packages. It also provides a step by step, theoretical and practical introduction to the development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser.

Course Contents:

Module I
PERL: Basic concepts, Programming with PERL.

Module II: Biological Databases
Format & Applications of Sequence and Structure databases of Nucleic Acids & Proteins (GENBANK, EMBL, DDBJ, PIR, UNIPROT, PDB, SCOP, CATH, PRINT, Pfam etc) Specialised databases.

Module III: Sequence Analysis
Introduction to DNA and protein sequence analysis, Translation, ORF finding, Local vs Global alignment, Pairwise Sequence Analysis, Multiple sequence Analysis, Scoring matrices, Analysis, Web based tools for sequence analysis.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Bioinformatics: Sequence and Genome Analysis, David W. Mount.
- Introduction to Bioinformatics, Teresa Attwood, David Parry-Smith.
- Current Topics in Computational Molecular Biology (Computational Molecular Biology), Tao Jiang, Ying Xu, Michael Zhang (Editors)
- Bioinformatics: Sequence, Structure and Databanks: A Practical Approach (The Practical Approach Series, 236), Des Higgins (Editor), Willie Taylor (Editor).
Course Objective:
Role of antibody engineering in biomedical applications and the importance of immuno genetics in disease processes, tissue transplantation and immune regulation are some of the areas of attributes of this course which can help the students to understand the biotechnology related to human kind.

Course Contents:

Module I: Introduction
Phylogeny of Immune System, Innate and acquired immunity, clonal nature of immune response Organization and structure of lymphoid organs Nature and Biology of antigens and super antigens Antibody structure and function; Types of immunity- innate, acquired, active and passive, antigen -antibody reactions, Major histocompatibilty complex, BCR and TCR, generation of antibody diversity Complement system

Module II
Cells of the immune system; hematopoiesis and differentiation, lymphocyte trafficking, B-Lymphocytes, T -Lymphocytes, macrophages, dendritic cells, natural killer, lymphokines and lymphokine activated killer cells, eosinophils, neutrophils and mast cells

Module III
Regulation of immune response-antigen processing and presentation, generation of humoral and cell mediated immune responses, activation of B and T lymphocytes, cytokines and their role in immune regulation, T cell regulation and MHC restriction, immunological tolerance

Module IV
Cell mediated toxicity-mechanism of T cell and NK cell mediated lysis, and macrophage mediated cytotoxicity, Hypersensitivity, Autoimmunity

Module V
Tumor immunology, Immunity to infectious agents Transplantation accines, Idiotype Network hypothesis and synthetic vaccines.

Module VI
Immunological Techniques: Immuno diffusion, immuno-electrophoresis, ELISA, RIA, fluorescence activated cell sorter, Hybridoma technology and its applications.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Basic Immunology by A.K. Abbas and A.H. Lichtman. Saunders W.B. Company
- Fundamentals of Immunology by W. Paul. Lippincott Williams and Wilkins

References:
- Immunology by W.L. Anderson. Fence Creek Publishing (Blackwell).
- Immunology: A Short Course by E. Benjamin, R. Coico and G. Sunshine. Wiley-Leiss Inc.
- Immunology by Roitt. Mosby – Yearbook Inc.
- Kuby Immunology by R.A. Goldsby, T.J. Kindt, and B.A. Osborne. Freeman
RECOMBINANT DNA TECHNOLOGY

Course Code: BTF 504  Credit Units: 03

Course Objective:
A complete understanding of molecular techniques like DNA sequencing, restriction mapping, PCR for the cloning and expression of genes implication can be obtained through the course. The successful application of biotechnology largely depends on these advanced molecular techniques.

Course Contents:

Module I: Introduction to the subject and the tools used in RDT and vectors
Restriction endonuclease, methyltransferase, ligase, polymerase, kinase, phosphatase, nuclease, transferase, reverse transcriptase, linkers, adapters DNA, RNA and protein markers. Overview of cloning and expression vectors, plasmid, phage (lambda and M13), cosmid, phagemids.

Module II: Blotting techniques and hybridization
Southern, Northern and Western blotting techniques. Radioactive and non-radioactive probes.

Module III: Polymerase chain reaction (PCR)
 Constituents and mechanisms of PCR, optimization of PCR condition, applications of PCR

Module IV: Cloning and selection of clones
Basic cloning experiment: Design of cloning strategy and stepwise experimental procedure including application of tools introduced in module I. Complementation, colony and plaque hybridization, restriction, PCR, plus-minus screening, immunoscreening.

Module V: Genomic and cDNA library
Construction of genomic and cDNA library, screening of libraries.

Module VI: Advanced techniques in RDT
Subtractive hybridization, gel retardation assay, DNase footprinting, in vitro transcription and translation, phage display, DNA sequencing (Maxam Gilbert, Sanger’s and automated), protein engineering.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
• Recombinant DNA by J.D. Watson et al. W.H. Freeman and Company

References:
• Molecular Biotechnology: Principles and Applications of Recombinant DNA by B.R. Grick and J.J. Pasternak. ASM Press
• Milestones in Biotechnology: Classic Papers on Genetic Engineering by J.A. Bavies and W.S. Reznikoff.
• Butterworth Heinemann.
• DNA Cloning: A Practical Approach by D.M. Glover and B.D. Hames. IRL Press.
COMPUTERS – III

Course Code: BTF 505 Credit Units: 03

Course Objective:
It enables the students to access biological information networks and databases in order to understand the different techniques of biotechnology to build detection systems especially in the prevention and treatment of human diseases. It will enable them to interact with the Linux GUI and command line interface. It also provides a step by step, theoretical and practical introduction to the development of useful tools for automation of complex computer jobs, and making these tools accessible on the network from a Web browser.

Course Contents:

Section A: Web page Designing

Module I
Introduction to HTML, Tags for bold, italic, underline, list, marque, inserting images, Hyperlinks, Paragraphs, Heading, Font, table creation with rowspan and colspan, Form tag, frameset, Mapping a Image

Module II
Introduction to Active Server Pages, Working with variables, Understanding VBScript control Structure, Vbscript Built in Functions, Working with objects (Response, Request, Application Session, server, ASP Server Object. Insert, update, delete record from a database-using ADO. Creation of Mail Server using SMTP protocol, paging

Module III
Simple Animation creation using Flash.

Section B: Linux

Module I
Introduction to Operating system, Functions of an OS, Features of Linux, Introduction to Kernel and Shell of Linux, Directory Structure, Shell commands for Directory and Files.

Module II
Working with the vi and Pico Editors Shell commands:- wc, sort, tail finger, find, diff, comm.,cut ,cp Paste, grep, Tee, ps, kill, in, who, tty who, who am I, su, chown, chmod, date, unique, touch, file.

Module III
Introduction to Shell script, shell variables, System variables, Control statements, Global variables, positional Parameters, set command, shift command

Module IV
System administrations: create, update and delete a user, Modifying and deleting groups. Introduction to file System, Mounting and unmounting the file system, FSCK command, creating a file system using FDISK Command, Back tips, back up schedule, Back up Tools.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- ASP in 21 Days by Scott Mitchell, James Atkinson publisher SAMS
- Red Hat Linux 6 fast and Easy by WitherSpoon, Publisher BPB

References:
- Linux Complete by Sybex, BPB
- Learning macromedia Flash 5 by Weixel Publisher: BPB
- Teach your self macromedia Flash 5 in 24 Hours by Kerman Publisher: BPB
STRUCTURAL BIOLOGY LAB

Course Code: BTF 520  Credit Units: 01

Course Contents:

Module I
Chemical modification of proteins

Module II
Peptide mapping

Module III
Analysis of amino acid composition.

Module IV
Analysis and interpretation of Spectrophotometric data for denaturation studies.

Module V
Crystallization of Lysozyme -pH driven and salt driven crystallization.

Module VI
Effect of concentration. BMCD

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
Course Code: BTF 521  Credit Units: 01

Course Contents:
The coursework for this practical session will follow the theory syllabus.

Module I
Programming with PERL.

Module II
Biological Databases: Format & Applications of Sequence and Structure databases of Nucleic Acids & Proteins (GENBANK, EMBL, DDBJ, PIR, UNIPROT, PDB, SCOP, CATH, PRINT, Pfam etc) Specialised databases.

Module III
DNA & Protein Sequence Analysis.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Class Test (Practical Based)</strong></td>
<td><strong>Mid Term Viva</strong></td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
IMMUNOLOGY LAB

Course Code: BTF 522 Credit Units: 01

Course Contents:

Module I
Blood film preparation and identification of cells.

Module II
Lymphoid organs and their microscopic organization.

Module III
Immunization, collection of serum.

Module IV
Purification of IgG from serum.

Module V
Separation of mononuclear cells by Ficoll-Hypaque.

Module VI
Con-A induced proliferation of thymocytes (by MTT method).

Module VII
Elisa.

Module VIII
Hapten conjugation and quantitation.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
RECOMBINANT DNA TECHNOLOGY LAB

Course Code: BTF 523  Credit Units: 01

Course Contents:

Module I
Quantitation of nucleic acids.

Module II
Construction of restriction map of plasmid DNA.

Module III
Bacterial expression sytem and Analysis

Module IV
Blotting techniques.

Module V
PCR amplification.

Module VI
Web-based tools for restriction mapping, Primer design tools on the web, DNA sequencing and fragments assembly tools like Sequencher, Phred, Phrap, and Consed etc.

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
<td>Attendance</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
<td>05</td>
</tr>
</tbody>
</table>
COMPUTERS LAB – III

Course Code: BTF 524 Credit Units: 01

Course Contents:

Module I
Designing the Static web pages using HTML, Front page.

Module II
Designing the Dynamic web pages using ASP: Insert update delete and retrieval of records from a Database(Oracle, SQL server, Ms – Access) through HTML.

Module III
Sending and receiving mail using SMTP. Designing a page using paging.

Module IV
Working with Linux commands like: ls, wc, sort, tail finger, find, diff, comm., cut, cp, Paste, grep, Tee, ps, kill, in, who, tty who, who am I, su, chown, chmod, date, unique, touch, file.

Module V
Designing the Shell Scripts, create, update and delete a user, Modifying and deleting groups.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
COMMUNICATION SKILLS - III

Course Code: BTF 541  Credit Units: 01

Course Objective:
To equip the participant with linguistic skills required in the field of science and technology while guiding them to excel in their academic field.

Course Contents:

Module I
Reading Comprehension
Summarising
Paraphrasing

Module II
Essay Writing
Dialogue Report

Module III
Writing Emails
Brochure
Leaflets

Module IV: Introduction to Phonetics
Vowels
Consonants
Accent and Rhythm
Accent Neutralization
Spoken English and Listening Practice

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>CAF</th>
<th>V</th>
<th>GD</th>
<th>GP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Effective English for Engineering Students, B Cauveri, Macmillan India
- Creative English for Communication, Krishnaswamy N, Macmillan
- A Textbook of English Phonetics, Balasubramanian T, Macmillan
BEHAVIOURAL SCIENCE - V
(GROUP DYNAMICS AND TEAM BUILDING)

Course Code: BTF 543 Credit Units: 01

Course Objective:
To inculcate in the students an elementary level of understanding of group/team functions
To develop team spirit and to know the importance of working in teams

Course Contents:

Module I: Group formation
Definition and Characteristics
Importance of groups
Classification of groups
Stages of group formation
Benefits of group formation

Module II: Group Functions
External Conditions affecting group functioning: Authority, Structure, Org. Resources, Organizational policies etc.
Internal conditions affecting group functioning: Roles, Norms, Conformity, Status, Cohesiveness, Size, Inter group conflict.
Group Cohesiveness and Group Conflict
Adjustment in Groups

Module III: Teams
Meaning and nature of teams
External and internal factors effecting team
Building Effective Teams
Consensus Building
Collaboration

Module IV: Leadership
Meaning, Nature and Functions
Self leadership
Leadership styles in organization
Leadership in Teams

Module V: Power to empower: Individual and Teams
Meaning and Nature
Types of power
Relevance in organization and Society

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:
- Organizational Behaviour, Davis, K.
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressers, David and Cans, Donald: The Study of Human Interaction
- LaFasto and Larson: When Teams Work Best, 2001, Response Books (Sage), New Delhi
• J William Pfeiffer (ed.) Theories and Models in Applied Behavioural Science, Vol 2, Group (1996); Pfeiffer & Company
Course Code: BTF 544
Credit Units: 02

Course Objective:
To furnish some basic knowledge of French culture and civilization for understanding an authentic document and information relating to political and administrative life

Course Contents:

Module D: pp. 131 – 156 Unités 10, 11

Contenu lexical:
Unité 10: Prendre des décisions
1. Faire des comparaisons
2. décrire un lieu, le temps, les gens, l'ambiance
3. rédiger une carte postale

Unité 11: faire face aux problèmes
1. Exposer un problème.
2. parler de la santé, de la maladie
3. interdire/demander/donner une autorisation
4. connaître la vie politique française

Contenu grammatical:
1. comparatif - comparer des qualités/quantités/actions
2. supposition : Si + présent, futur
3. adverbe - caractériser une action
4. pronom "Y"

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- le livre à suivre: Campus: Tome 1
Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Genitive case
Genitive case – Explain the concept of possession in genitive
Mentioning the structure of weak nouns

Module II: Genitive prepositions
Discuss the genitive propositions and their usage: (während, wegen, statt, trotz)

Module III: Reflexive verbs
Verbs with accusative case
Verbs with dative case
Difference in usage in the two cases

Module IV: Verbs with fixed prepositions
Verbs with accusative case
Verbs with dative case
Difference in the usage of the two cases

Module V: Texts
A poem ‘Maxi’
A text Rocko

Module VI: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
Course Code: BTF 546  Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules

Module II
Future Tense

Module III
Presentations in English on
Spanish speaking countries’
Culture
Sports
Food
People
Politics
Society
Geography

Module IV
Situations:
En el hospital
En la comisaria
En la estacion de autobus/tren
En el banco/cambio

Module V
General revision of Spanish language learnt so far.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- Español Sin Fronteras, Greenfield
Course Objective:
To enable the students to converse, read and write language comfortably and be able to converse using different patterns and forms taught through out. Students are taught and trained enough to get placed themselves in Japanese companies.
Note: Teaching is done in roman as well as Japanese script.

Course Contents:

Module I
Dictionary form of the verbs, joining of verbs
Negative form of verbs
Potential form

Module II
Joining of many actions together
Usage of dictionary form of the verbs in sentences
Introducing colloquial language.

Module III
Direct form of the speech, quotations,
Expressing thoughts
Actions and reasoning

Module IV
Conclusion
Receiving and giving things, favour etc.
Different forms like ‘tara’ form.

Module V
Revision of the whole syllabus

Learning Outcome
➢ Students can speak and use different patterns, ways to describe a particular situation and can converse comfortably in mentioned situations through out.
➢ Students can appear in the interviews for placements in Japanese companies.

Methods of Private study /Self help
➢ Teaching will be supported by handouts, audio-aids, and self-do assignments and role plays.
➢ Use of library, visiting and watching movies in Japan and culture center every Friday at 6pm.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

Text:
➢ Teach yourself Japanese

References:
➢ Shin Nihongo no kiso 1
Course Code: BTF 548  Credit Units: 02

Course Objective:
What English words come from Chinese? Some of the more common English words with Chinese roots are ginseng, silk, dim sum, fengshui, typhoon, yin and yang, T’al chi, kung-fu. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order

Module II
Intonation
Chinese foods and tastes – tofu, chowmian, noodle, Beijing duck, rice, sweet, sour….etc. Learning to say phrases like – Chinese food, Western food, delicious, hot and spicy, sour, salty, tasteless, tender, nutritious, god for health, fish, shrimps, vegetables, cholesterol is not high, pizza, milk, vitamins, to be able to cook, to be used to, cook well, once a week, once a month, once a year, twice a week…… Repetition of the grammar and verbs taught in the previous module and making dialogues using it.
Compliment of degree “de”.

Module III
Grammar the complex sentence “suiran … danshi…..”
Comparison – It is colder today than it was yesterday…..etc.
The Expression “chule….yiwei”. (Besides)
Names of different animals.
Talking about Great Wall of China
Short stories

Module IV
Use of “huozhe” and “haishi”
Is he/she married?
Going for a film with a friend.
Having a meal at the restaurant and ordering a meal.

Module V
Shopping – Talking abut a thing you have bought, how much money you spent on it? How many kinds were there? What did you think of others?
Talking about a day in your life using compliment of degree “de”. When you get up? When do you go for class? Do you sleep early or late? How is Chinese? Do you enjoy your life in the hostel?
Making up a dialogue by asking question on the year, month, day and the days of the week and answer them.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- “Elementary Chinese Reader ” Part-II Lesson 39-46
SUMMER PROJECT - I

Course Code: BTF 560 Credit Units: 06

GUIDELINES FOR SUMMER PROJECT

The main objective of Summer Project is to familiarize students to laboratory environment and make them learn to handle equipments and softwares, design experiments and analyze the results. The student will be supervised by one or more faculty members and he or she will be required to submit a synopsis. While writing a synopsis emphasis should be given to make it publishable. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student. Initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals;
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components:

- TITLE PAGE
- CERTIFICATE
- ACKNOWLEDGEMENT
- ABBREVIATIONS
- CONTENTS WITH PAGE NUMBERS
- CHAPTER –
  a. INTRODUCTION
  b. REVIEW OF LITERATURE
  c. MATERIALS & METHODS
  d. RESULTS & DISCUSSION
  e. SUMMARY AND CONCLUSION
  f. REFERENCES
  g. APPENDIX (OPTIONAL)

- 1 inch Margin on left side & 1”each on other sides.
- Single side of the paper to be used.
- Times New Roman.

Font Size

- 12 (Bold for headings)
- 12 (Normal for Matter)
- 14 (for Chapter Names)
- 1.5 line spacing
- Numbering on the right hand Top of the page
- Numbers on pages before chapters to be done in Roman at the bottom of the page

References

This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

Examples

For Research Article

For Book

- Scientific names in Italics
- Cover Page containing - Title, Students Name, Supervisors Name, University, Name (along with logo), Course name & year of Submission in the prescribed format
- 2 copies to be submitted

ASSESSMENT OF THE PROJECT FILE

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Evaluation will compose of two components - Project report assessment and Viva-voce. Project report assessment will be done by the two internal faculty members in respective fields. A committee of three faculty members will conduct Viva-voce.

Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project will be assessed as per evaluation format.

Examination Scheme:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissertation</td>
<td>50</td>
</tr>
<tr>
<td>Viva Voce</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>
GENOMICS

Course Code: BTF 601  Credit Units: 03

Course Objective:
The objective is to explain the structure, function, replication and evolution of eukaryotic genomes. Emphasis will be on current gene expression profiling techniques, different tools for analysis of human genomes.

Course Contents:

Module I
Introduction to Genomics, Size and structure of genomes in different organisms, comparative genome analysis.

Module II
Databases and web based resources for genomics research and analysis.

Module III
Gene expression profiling, identification of genes, data analysis-statistical & clustering, Applications of Gene expression profiling

Module IV: Human Genome
Tools for analysis of human genome, Alternative splicing models, Probing with ESTs, Exon Microarray, Implications in Cancer genetics, SNPs, Pharmacogenomics

Module V
Microarray Technologies
Introduction, DNA microarrays, Basics of designing a microarray, Image analysis, Normalization Variability and replication, Clustering, Microarray Databases

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Introduction to Computational Molecular Biology, Joao Meidanis, Joao C. Setabal,
- Genomes, Terence A. Brown

References:
- Handbook of Comparative Genomics: Principles and Methodology, Cecilia Saccone, Graziano Pesole
- Sequence - Evolution - Function: Computational Approaches in Comparative Genomics, Eugene V. Koonin, Michael Y. Galperin
- Comparative Genomics - Empirical and Analytical Approaches to Gene Order Dynamics, Map Alignment and the Evolution of Gene Families, David Sankoff and Joseph H. Nadeau, Comparative Genomics, Melody Clark
- Bioinformatics: Sequence and Genome Analysis, David W. Mount.
COMPUTATIONAL PROTEOMICS

Course Code: BTF 602 Credit Units: 03

Course Objective:
The broad objective of this course is to describe basic principles of protein structure including protein structure motifs, properties of alpha helices and beta sheets and protein folding. The aim is to explain to the students how a protein's conformation determines its biochemical activity, how a protein's structure enables binding to other molecules and how a protein's function can be deduced from its primary structure. It describes the techniques used for solving the 3-D structure of a protein.

Course Contents:

Module I: Introduction to Proteomics
Introduction to Proteome analysis, 2D-gel electrophoresis, high-throughput proteome analysis with 2D-IEF, chromatography-HPLC, GC; amino acid sequencing, mass spectrometry.

Module II
Structure function relationship
Protein-protein interactions – Large molecular complexes – RNA polymerase II, ribosome; SUMO Protein-protein interactions in health and disease; Posttranslational modifications – concepts of how protein function is rapidly and dynamically modulated through posttranslational modifications, how posttranslational modifications precede altered transcription levels.

Module III
Structure determination – experimental and theoretical methods for determination of protein molecular size, X-ray diffraction technique, NMR spectroscopy, Databases for protein structures.

Module IV
Protein Engineering Techniques

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Introduction to Protein Structure by Carl-Ivar Branden, John Tooze
- Principles of Protein structure by Schultz, G. E., and Schirmer, R. H.,Proteomics by Daniel C. Leibler
- Proteins: Structures and Molecular Principles (2d ed.), by TE Creighton
- Organic spectroscopy by William Kemp
- Proteome Research: Two-Dimensional Gel Electrophoresis and Detection Methods (Principles and Practice), T. Rabilloud (Editor), 2000, Springer Verlag
- Bioinformatics: From Genomes to Drugs by T. Lengauer. John Wiley and Sons Inc.
- Bioinformatics: Sequence and Genome Analysis by D.W. Mount. Cold Spring Harbor Laboratory Press
- Database Annotation in Molecular Biology : Principles and Practice by Arthur M. Lesk
- Proteomics by T. Palzkill. Publisher: Kluwer Academic Publishers
COMPUTATIONAL BIOLOGY - II

Course Code: BTF 603 Credit Units: 03

Course Objective:
The objective is to describe how molecular data can be used to construct a phylogenetic tree and Characterize the rates and causes of nucleotide substitutions. The aim is also to explain how a gene/protein family arises and the mechanisms which underlie evolution at the molecular level.

Course Contents:

Module I: Phylogenetic prediction
Trees-splits and metrics on trees, tree interpretation, Distance – additive, ultrameric and nonadditive distances, tree building methods, phylogenetic analysis, parsimony, tree evaluation, maximum likelihood trees – continuous time markov chains, estimating the rate of change, likelihood and trees; analysis software.

Module II
Predictive methods using protein sequences – protein identification, physical properties, motifs and patterns, 3D-structure prediction techniques, folding classes, structure classification;

Module III
Systems Biology

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Biocomputing hypertext coursebook at http://www.techfak.unibielefeld.de/bcd/Curric/welcome.html/
- Bioinformatics: Sequence and Genome Analysis by D.W. Mount. Cold Spring Harbor Laboratory Press
- Computational Modeling of Genetic and Biochemical Networks by J.M. Bower and H. Bolouri. MIT Press
- Introduction to Bioinformatics by T. Attwood and D. Parry-Smith. Prentice Hall
- Sequence Analysis in Molecular Biology: Treasure Trove or Trivial Pursuit by G. V. Heijne and G.V. Heijne. Academic Press
BIOINFORMATICS ALGORITHMS

Course Code: BTF 604 Credit Units: 03

Course Objective:
The objective of this course is to provide exposure to students to the broad range of algorithms in the field of bioinformatics. It is important to acquire a knowledge of the algorithms employed in various software systems to have the ability to understand and evaluate them rather than just use them.

Course Contents:

Module I
Introduction to algorithms, Difference between – Biological vs Computer algorithms, Correct vs Incorrect algorithms, Iterative vs Recursive algorithms, Fast vs Slow algorithms, Tractable vs Intractable problems.

Module II
Big-O notation, Brief about the different types of algorithm design techniques (Exhaustive search, Branch-and-Bound algorithms, Greedy algorithms, Dynamic programming, Divide-and-Conquer algorithms, Machine Learning, Randomized algorithms)

Module III
Neural Network, Hidden Markov Models.

Module IV
Dynamic programming – its background (sequence alignment – local, global, Gap penalties, scoring of alignments), Needleman-Wunch algorithm, Smith-Waterman algorithm.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Essentials of Genomics and Bioinformatics – by C.W. Sensen. John Wiley and Sons
- Introduction to Bioinformatics by T. Attwood and D. Parry-Smity. Prentice Hall
COMPUTERS – IV

Course Code: BTF 605  Credit Units: 03

Course Objective:
The objective is to introduce students to a modern programming language and help them gain sufficient fluency to undertake research projects with a programming component; to lay the foundations for more advanced study of object-oriented languages
Emphasis is on to understand the basic concepts of programming; to learn the syntax and semantics of Java; to be able to use a program development environment

Course Contents:

Module I: (Core Java)
Introduction to Java - Features, Inheritance, Strings, Packages , Interfaces; Multi- Threading, Applet Programming: AWT- Components, Menus, Layout manager, etc., Event Handling, Swings, Java Packages - java.util, -java.io; exception handling.

Module II
JDBC
Introduction to Client Server Application
Java Drivers
java.sql Package
Executing SQL Statements

Module III
Java Servlets
Introduction to Server Side Application Development
Basics of Servlet Programming
Web Container
Session Tracking
Servlet Context

Module IV
JSP - Java Server Pages
JSP and Servlets (Differences and Similarity)
JSP details - directives, scriplets, expressions, JSP tags

Module V: Basics of XML
Features & uses of XML.
Parsers, Entities, Attributes
DTD

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Complete reference by Herbert Schildt  TataMcGraw Hill
- Programming with java A Primer by Balagurusamy Publisher: TataMcGraw Hill
- The complete Guide to java by Siple.TataMcGraw Hill
GENOMICS LAB

Course Code: BTF 620  Credit Units: 01

Course Contents:
All the lab. work would be done using Web based tools.

Module I
Comparative genome analysis.

Module II
Databases and web based resources for genomics research and analysis.

Module III
Gene expression profiling & Applications of Gene expression profiling

Module IV
Tools for analysis of human genome

Module V
Web based resources for Microarray Technologies

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>Pract. Based</td>
<td>Attendance</td>
</tr>
<tr>
<td></td>
<td>Major Experiment</td>
</tr>
<tr>
<td></td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td></td>
<td>Practical Record</td>
</tr>
<tr>
<td></td>
<td>Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>05</td>
<td>35</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
Course Code: BTF 621  Credit Units: 01

Course Contents:
The coursework for this practical session will follow the theory syllabus.

Module I
Protein identification, physico-chemical properties, motifs and patterns, structure, folding classes, structure classification

Module II
Databases for 2D GEL and MS data.

Module III
Web based Graphics Visualisation and analysis tools like Protein Explorer.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td>Attendance</td>
<td>Practical Record</td>
</tr>
<tr>
<td>Viva</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
COMPUTATIONAL BIOLOGY LAB - II

Course Code: BTF 622 Credit Units: 01

Course Contents:

Module I
Motif and pattern searching

Module II
Phylogenetic prediction and analysis

Module III
3D-Structure prediction tools

Module IV
Protein structure classification resources

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
BIOINFORMATICS ALGORITHMS LAB

Course Code: BTF 623  Credit Units: 01

Course Contents:

The coursework for this practical session will follow the theory syllabus.

1. Practical usage of different algorithms with special emphasis given to Needleman-Wunch algorithm and Smith-Waterman algorithm.
2. Practical usage of Graph theory.

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>15</td>
<td>35</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>10</td>
<td>15</td>
</tr>
<tr>
<td>Attendance</td>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>Major Experiment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minor Experiment/Spotting</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Practical Record</td>
<td></td>
<td>10</td>
</tr>
<tr>
<td>Viva</td>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
COMPUTERS LAB - IV

Course Code: BTF 624                      Credit Units: 02

Course Contents:
The coursework for this practical session will follow the theory syllabus.

Module I
Class, Object, Inheritance, Packages, Multithreading, Exception Handling, Strings.

Module II
Designing User interface using AWT, Swings

Module III
Developing Event Handling programs

Module IV
Developing Java programs to Interact with the Database: Fetching, retrieval, updation and deletion of the Records from the database like Oracle, SQL Server, and Ms Access.

Module V
Client server computing with JSP and Serve lets

Module VI
Designing the XML program using DTD

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>IA</td>
</tr>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
COMMUNICATION SKILLS - IV

Course Code: BTF 641 Credit Units: 01

Course Objective:
To enhance the skills needed to work in an English-speaking global business environment.

Course Contents:

Module I: Business/Technical Language Development
Advanced Grammar: Syntax, Tenses, Voices
Advanced Vocabulary skills: Jargons, Terminology, Colloquialism
Individualised pronunciation practice

Module II: Social Communication
Building relationships through Communication
Communication, Culture and Context
Entertainment and Communication
Informal business/Technical Communication

Module III: Business Communication
Reading Business/Technical press
Listening to Business/Technical reports (TV, radio)
Researching for Business/Technology

Module IV: Presentations
Planning and getting started
Design and layout of presentation
Information Packaging
Making the Presentation

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>CAF</th>
<th>V</th>
<th>GD</th>
<th>GP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

- Business Vocabulary in Use: Advanced Mascull, Cambridge
- Business Communication, Raman – Prakash, Oxford
- Business Communications, Rodgers, Cambridge
- Working in English, Jones, Cambridge
- New International Business English, Jones/Alexander, Cambridge
BEHAVIOURAL SCIENCE - VI
(STRESS AND COPING STRATEGIES)

Course Code: BTF 643
Credit Units: 01

Course Objective:
To develop an understanding the concept of stress its causes, symptoms and consequences.
To develop an understanding the consequences of the stress on one’s wellness, health, and work performance.

Course Contents:

Module I: Stress
Meaning & Nature
Characteristics
Types of stress

Module II: Stages and Models of Stress
Stages of stress
The physiology of stress
Stimulus-oriented approach.
Response-oriented approach.
The transactional and interactive model.
Pressure – environment fit model of stress.

Module III: Causes and symptoms of stress
Personal
Organizational
Environmental

Module IV: Consequences of stress
Effect on behaviour and personality
Effect of stress on performance
Individual and Organizational consequences with special focus on health

Module V: Strategies for stress management
Importance of stress management
Healthy and Unhealthy strategies
Peer group and social support
Happiness and well-being

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:

- Blonna, Richard; Coping with Stress in a Changing World: Second edition
- Pestonjee, D.M, Pareek, Udai, Agarwal Rita; Studies in Stress And its Management
- Pestonjee, D.M.; Stress and Coping: The Indian Experience
- Clegg, Brian; Instant Stress Management – Bring calm to your life now
Course Code: BTF 644  Credit Units: 02

Course Objective:
To strengthen the language of the students both in oral and written so that they can:
i) express their sentiments, emotions and opinions, reacting to information, situations;
ii) narrate incidents, events;
iii) perform certain simple communicative tasks.

Course Contents:

Module D: pp. 157 – 168 – Unité 12

Unité 12: s'évader
1. présenter, caractériser, définir
2. parler de livres, de lectures
3. préparer et organiser un voyage
4. exprimer des sentiments et des opinions
5. téléphoner
6. faire une réservation

Contenu grammatical:
1. proposition relative avec pronom relatif "qui", "que", "où" - pour caractériser
2. faire + verbe

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
- le livre à suivre : Campus: Tome 1
GERMAN - VI

Course Code: BTF 645 Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Adjective endings
Adjective endings in all the four cases discussed so far
Definite and indefinite articles
Cases without article

Module II: Comparative adverbs
Comparative adverbs as and like

Module III: Compound words
To learn the structure of compound words and the correct article which they take
Exploring the possibility of compound words in German

Module IV: Infinitive sentence
Special usage of ‘to’ sentences called zu+ infinitive sentences

Module V: Texts
A Dialogue: ‘Ein schwieriger Gast’
A text: ‘Abgeschlossene Vergangenheit’

Module VI: Comprehension texts
Reading and comprehending various texts to consolidate the usage of the constructions learnt so far in this semester.

Module VII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
SPANISH – VI

Course Code: BTF 646 Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, voice modulations/intonations to handle everyday Spanish situations in Present as well as in Present Perfect Tense with ease.

Course Contents:

Module I
Revision of the earlier modules

Module II
Present Perfect Tense

Module III
Commands of irregular verbs

Module IV
Expressions with Tener que and Hay que

Module V
En la embajada
Emergency situations like fire, illness, accident, theft

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español, En Directo I A
- Español Sin Fronteras
Course Objective:
To enable the students to converse in the language with the help of verbs and the usage of different sentence patterns, which help them to strengthen the language.
Students are taught and trained enough to get placed in Japanese companies.
Note: The teaching is done in roman as well as Japanese script. 10 more kanjis are introduced in this semester.

Course Contents:

Module I: Polite form of verbs
Expressing feelings with the polite forms of verb.

Module II: Potential form
Ability of doing or not doing something

Module III: Conjunctions
Joining two sentences with the help of shi and mo

Module IV: Intransitive Verbs
Sentence patterns of indirect speech

Module V: Feelings and expressions
Regret, existence etc.

Learning Outcome
➢ Students can speak the language with the use of different forms of verb.

Methods of Private study/ Self help
➢ Hand-outs, audio-aids, assignments and role-plays will support classroom teaching.
➢ Students are encouraged to watch Japanese movies at Japan Cultural and information center.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Shin Nihon-go no Kiso Lesson No. 26 to 30.
- All vocabulary and topics taught are from the above-mentioned book.
Course Objective:
Chinese emperor Qin Shi Huang – Ti who built the great wall of China also built a network of 270 palaces, linked by tunnels, and was so afraid of assassination that he slept in a different palace each night. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
Pronunciation and intonation.
Character writing and stroke order.

Module II
Going out to see a science exhibition
Going to the theatre.
Train or Plane is behind schedule.
Indian Economy-Chinese Economy
Talking about different Seasons of the Year and Weather conditions. Learning to say phrases like-spring, summer, fall, winter, fairly hot, very cold, very humid, very stuffy, neither hot nor cold, most comfortable, pleasant …. etc.

Module III
Temperature – how to say – What is the temperature in May here?
• How is the weather in summer in your area?
• Around 30 degrees
• Heating, air-conditioning
• Is winter is Shanghai very cold?
Talking about birthdays and where you were born?
The verb “shuo” (speak) saying useful phrases like speak very well, do not speak very well, if speak slowly then understand if speak fast then don’t understand, difficult to speak, difficult to write, speak too fast, speak too slow, listen and can understand, listen and cannot understand … etc.
Tell the following in Chinese – My name is …. I was born in … (year). My birthday is …….. Today is … (date and day of the week). I go to work (school) everyday. I usually leave home at . (O’clock). In the evening, I usually ……….. (do what)? At week end, I …………. On Sundays I usually ………….. It is today….. It will soon be my younger sisters birthday. She was born in …… (year). She lives in ……… (where). She is working (or studying)…… where… She lives in …….. (where.)

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:
• Elementary Chinese Reader Part-2 ,3 ; Lesson 47-54
CLINICAL DATA MANAGEMENT

Course Code: BTF 701  Credit Units: 03

Course Objective:
Students will gain a solid understanding of Good Clinical Practices (GCP) and will explore ways of implementing GCP, including risk assessment and trial monitoring.

Course Contents:

Module I
Introduction to Disease Processes.

Module II: Fundamentals of clinical trials
Fundamental principles of comparative clinical trials in investigating effectiveness, efficacy and safety of treatments, benefits of clinical trials in comparison to alternative study designs, Main features of clinical trials, Key decisions surrounding design (including sample size), delivery and assessment of clinical trials.

Module III
Basic statistics for clinical trials, How to select and apply appropriate statistical methods to analyse data from clinical trials, presenting, interpreting and discussing the analyses clearly and concisely.

Module IV: Clinical trials in practice
Key steps in implementing a clinical trial, clarifying and operationalising the primary and secondary objectives of clinical trials, the implications of design choices for implementation of a trial, trial governance, clearances (including research and ethical clearance), and data collection and recruitment methods. Quality assurance and control, data processing, management issues including post-trial monitoring.

Module V
Reporting and reviewing clinical trials

Module VI: Protocol development
Steps to be taken for preparing the protocol for a trial, including data collection forms, logistical and budgetary issues, and procedures of different funding bodies.

Module VII: Trial designs
Use of different trial designs such as non-inferiority and equivalence, cross-over, factorial, multi-armed and cluster randomised trials

Module VIII: Data monitoring and interim analyses
Issues relating to the on-going monitoring of the data in a study in order that sufficient data are available to answer the trial’s question reliably without recruiting more patients than necessary, or exposing them to unacceptable risks.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Clinical Data Management Richard K. Rondel (Editor), Sheila A. Varley (Editor), Colin F. Webb (Editor)
- Practical Guide to Clinical Data Management by Susanne Prokscha
- Design and Analysis of Clinical Trials : Concepts and Methodologies (Wiley Series in Probability and Statistics) by: Shein-Chung Chow, Jen-Pei Liu
DATA MINING

Course Code: BTF 702  Credit Units: 03

Course Objective:
The course is designed to introduce data mining and its related elements to the students. In striving to achieve this objective, the course uses besides others, lectures on various important aspects like Graph theory, different algorithms etc.

Course Contents:

Module I
Knowledge Discovery in Databases, Concept of datamining, Need of datamining, Data mining functionalities.

Module II
Concept of Data Warehouse, Data Warehouse Architecture, Online Analytical Processing (OLAP), Development of Data Warehouse life cycle.

Module III
Data preprocessing, Basic methods of data cleaning, data integration and Transformation, Data reduction, Discretization and Concept Hierarchy Generation

Module IV
Data mining Primitives, Data Mining Query Language, Mining Complex Type of data: Multimedia database, Mining Spatial database, Mining text database, Architecture of data mining system, multidimentional data mining

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Data Mining: Multimedia, Soft Computing, and Bioinformatics by Mitra, Sushmita Acharya, Tinku, John Wiley & Sons Inc
- Bioinformatics: The Machine Learning Approach by Pierre Baldi, Sren Brunak
SAS (STATISTICAL ANALYSIS SYSTEM) AND R

Course Code: BTF 703  Credit Units: 02

Course Objective:
SAS software provides a complete, comprehensive set of tools that can meet the data analysis needs. The course is designed to familiarize students with the skills necessary to produce simple reports and data sets as well as providing an understanding of how SAS analyses and views data. The students will also work on R which is a language and environment for statistical computing and graphics, provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible.

Course Contents:

Module I
Introduction to SAS

Module II: Manipulating Data
SAS syntax, variable naming rules, and entering your own data, Creating a SAS data set from raw data, Grouping Data values, Reading and combining SAS data sets. Relating information from multiple sources, Data translation tools, Manipulating and formatting date values

Module III: Programming Techniques
Plotting Data, Random Number Generators, If-Then-Else and Do Loops, Arrays, Retaining data across observations, Macro Programming

Module IV: Presenting Data
Writing simple reports, Descriptive statistics and summaries, Formatting tools, Charting data, Plotting data

Module V: R
Introduction and preliminaries of R, Simple manipulations; numbers and vectors, Objects, their modes and attributes, Ordered and unordered factors, Arrays and matrices, Lists and data frames, Reading data from files, Probability distributions, Grouping, loops and conditional execution, Writing your own functions, Statistical models in R, Graphical procedures, Packages

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:

References:
- SAS Learning Edition
**BIOPERL**

Course Code: BTF 704  
Credit Units: 02

**Course Objective:**  
The objective of this course is to make students well versed with applications of Bioperl.

**Course Contents:**

Module I  
Introduction to BioPerl, Basics of Packages, Modules and Widgets, Internet-related Libraries

Module II  

Module III  
Application of Bioperl in Bioinformatics, Manipulation of BLAST output with BioPerl Programming.

Module IV  
Creating User Interface with PERL/Tk, Perl Module Extension

**Examination Scheme:**

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

**Text & References:**

*Text:*  
- Mastering Perl for Bioinformatics, James D. Tisdall

*References:*  
- Beginning Perl for Bioinformatics, James Tisdall
Course Code: BTF 705  Credit Units: 02

Course Objective:
The objective of this course is to make students well versed with concept and implementation of BIOJAVA.

Course Contents:

Module I
Introduction to BioJava, Installation and getting started

Module II: Basic Sequence Manipulation
Working with sequences SubSequence, Transcribe, Reverse, Change Name, Sequence Edit, Regex, Translation, Translation: Single, Translation: Six Frames, Proteomics, A Aindex

Sequence I/O
Reading and writing files, Creative file parsing with RichSeqIOListener
Write in Fasta, Read Fasta, Read GES, Gbto Fasta, ABI to Sequence, SeqIO: Echo

Annotation
Annotations and Comments, Annotations: List, Filter

Location & Feature
Locations: Point, Range, Circular, Feature, Filter, Locations: Remove

Module III: Blast & Fasta
Blast: Parser, Fasta: Parser, Blast: Extract, Blast: Echo

Module IV: Counts & Distribution
Count: Residues, Count: Frequency, To Distrib, Random Seqs, Entropy, Emissionf, Custom
BioJava: Cook Book: Distribution: XML, Distribution: Gibbs, Distribution: Bayes, Distribution: Composition

Weight Matrices and Dynamic Programming

User Interface
ViewAsTree, ViewInGUI, Coordinates, Features, ProteinPeptideFeatures

Module V: Biosql and Database
BioSQL and Hibernate. , BioSQL Setup PostGre, BioSQL: Setup Oracle, BioSQL: Manage

Protein Structure
PDB: read, PDB: mutate

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

**Text:**
- The Complete Reference JAVA 2: 5th. ed. By Schildt Herbert

**References:**
- Core Java: Advanced Features, Horstmann
- Java Servlet Programming Hunter J, Crauford
- Java Server Programming J2EE edition Allamaraju, et.al.
Course Code: BTF 706  
Credit Units: 02

Course Objective:
The objective of this course is to make students well versed with concept and implementation of .NET technology into different type of application.

Course Contents:

Module I
Introduction to Visual Basic .NET and .NET framework, Variables and Constants Programming Constructs, Implement Arrays, Object – oriented features of Visual Basic.NET , Option statement, Typecasting, procedures and functions, delegates, Implement classes in VB.NET, events handling,

Module II
Properties, Polymorphism, Inheritance, Implement Method Overriding, Interfaces, Multithreading, collection, Implement error handling

Module III
ADO .NET architecture, components of ADO.NET, Command and Connection Objects Transactions in ADO.NET, use of Dataset, Data Adapter and Data Reader object Use the Data Grid Control; List the properties and methods of the Data Grid Control Data Bind in Data Grid, Insert, Update and Delete data in Data Grid Control

Module IV
MDI and SDI applications, Menu Control, Dynamic Menu, Image List Control, Tool Bar and Status Bar Controls, Use the Timer Control, Tree View Control, List View Control

Module V
Crystal Reports (Type of crystal report, Crystal Report Viewer, Work with Crystal Report Expert), Bind Crystal Reports to Windows Forms applications, Help class and its Components, Packaging and Deploying concepts, Package Resources, various deployment alternatives

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:
- Visual basic .net Black book by Dreamtech Steven HolZner

References:
- Programming Visual Basic.NET 2003, Jesse Liberty and Orelly
- Mastering VB .net, BPB Publications
- VB .net complete, BPB publication
- Visual Basic Step by Step, Microsoft
R AND BIOCONDUCTOR

Course Code: BTF 707  Credit Units: 02

Course Objective:
SAS software provides a complete, comprehensive set of tools that can meet the data analysis needs. The course is designed to familiarize students with the skills necessary to produce simple reports and data sets as well as providing an understanding of how SAS analyses and views data. The students will also work on R which is a language and environment for statistical computing and graphics. Provides a wide variety of statistical (linear and nonlinear modelling, classical statistical tests, time-series analysis, classification, clustering, ...) and graphical techniques, and is highly extensible.

Course Contents:

Module I: R
Introduction and preliminaries of R, Simple manipulations; numbers and vectors, Objects, their modes and attributes, Ordered and unordered factors, Arrays and matrices, Lists and data frames, Reading data from files, Probability distributions, Grouping, loops and conditional execution, Writing your own functions, Statistical models in R, Graphical procedures, Packages.

Module II: BioConductor
Introduction to BioConductor, Intro to microarrays, installing and maintaining bioconductor, BioConductor Packages importation and QC, normalization, exprSets, filtering, data analysis options, annotation, GO/pathways/graphs.

Module III: Case Study
Limma, Case study on Microarray Classification, Incorporating biological metadata in genomic analyses, Statistical modeling of differential gene expression data Visualizing genomic data, Applying machine learning clustering and classifying methods to genomic data.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

Text:

References:
CLINICAL DATA MANAGEMENT LAB

Course Code: BTF 720  
Credit Units: 01

Course Contents:

Module I
Database Management Systems (DBMS) for Clinical Research, Creating Tables and Relationships, CRF design, Creating Forms for Data Entry, Display and Filtering; Query and Report Basics, Exporting and Analyzing the Data, planning and budgeting for Data Management in a Clinical Research Study, Demonstrations of Database Management Systems for Clinical Research Studies, Oracle clinical, SAS, etc packages

Module II
Basic data analyses from clinical trials using the computer-based Stata software package.

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th></th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>15</td>
<td>10</td>
<td>05</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>35</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Attendance</td>
<td>05</td>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td>Major Experiment</td>
<td>10</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
DATA MINING LAB

Course Code: BTF 721
Credit Units: 01

Course Contents:

Module I
Using different data samples, practical experimentation with the various stages of data mining.
Use of Meta-Search Engines.
Using different data samples, practical experimentation with the various stages of data mining.

Module II
Use and result interpretation of Pratt, MEME, Miner, and Mast servers.
Demonstration of free data mining Software like WEKA, Yale, TANAGRA, DB2 Intelligent Miner

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test</td>
<td>Mid Term Viva</td>
<td>Attendance</td>
</tr>
<tr>
<td>(Practical</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Based)</td>
<td>15</td>
<td>05</td>
</tr>
<tr>
<td>Attendance</td>
<td>10</td>
<td>35</td>
</tr>
<tr>
<td>Viva</td>
<td>05</td>
<td>35</td>
</tr>
<tr>
<td>Major Experiment</td>
<td>35</td>
<td>15</td>
</tr>
<tr>
<td>Minor Experiment/Spotting</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>Practical Record</td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>Viva</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
SAS (STATISTICAL ANALYSIS SYSTEM) AND R LAB

Course Code: BTF 722
Credit Units: 01

Course Contents:

Module I
Analysis using SAS

Module II
Analysis using R

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
Course Code: BTF 723  Credit Units: 02

Course Contents:

Module I
Format converter, Code reading, Sequence analysis, Bio::SeqIO, Alignment modules, Application, Protal2dna, AlignIO

Module II
Running Blast, Blast Parsing, Blast:: Tools:: Blite family parser, PSI-BLAST
Accessing a local database, database classes
GeneScan, Filehandle and stream

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>IA</td>
<td>EE</td>
</tr>
<tr>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
</tr>
<tr>
<td>15</td>
<td>10</td>
</tr>
</tbody>
</table>
BIOJAVA LAB

Course Code: BTF 724  Credit Units: 02

Course Contents:

Module I
Basic sequence manipulation, Six Frame Translation, Transcription, AAIndex

Module II
Reading and Writing of Files, Parsing of different file format like FASTA, Swissprot, Genbank

Module III
Annotation and file filtering, Location and feature

Module IV
BLAST and FASTA programming. Dynamic Programming.

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class Test (Practical Based)</td>
<td>Mid Term</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Viva</td>
</tr>
<tr>
<td></td>
<td>Attendance</td>
<td>Major Experiment</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Practical Record</td>
</tr>
<tr>
<td>IA</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>05</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>
VB .NET LAB

Course Code: BTF 725  Credit Units: 02

Course Contents:
The coursework for the practical session will follow the theory syllabus and will be based on Window Applications using .NET

Module I
Implementation of function, procedures, delegates, classes in events handling in vb .net.

Module II
Implementation of Polymorphism, Inheritance, Method Overriding, Interfaces, Multithreading, collection, error handling in VB.Net

Module III
Database handling using ADO .NET, Insert Update, delete and retrieval of data using ADO .Net.

Module IV
Creation of MDI and SDI applications, Menu Control, Dynamic Menu, Image List Control, Tool Bar and Status Bar Controls, Use the Timer Control, Tree View Control, List View Control.

Module V
Creation of Crystal Reports (Type of crystal report , Crystal Report Viewer, Work with Crystal Report Expert), Bind Crystal Reports to Windows Forms applications, Help class and its Components, Packaging and Deploying concepts, Package Resources

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td>Attendance</td>
<td>Practical Record</td>
</tr>
<tr>
<td>Viva</td>
<td>Viva</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td>Attendance</td>
<td>Practical Record</td>
</tr>
<tr>
<td>Viva</td>
<td>Viva</td>
</tr>
</tbody>
</table>

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |

| Class Test (Practical Based) | Major Experiment |
| Mid Term Viva | Minor Experiment/Spotting |
| Attendance | Practical Record |
| Viva       | Viva        |
Course Code: BTF 726
Credit Units: 02

Course Contents:

Module I
Analysis using SAS

Module II
Analysis using R

Examination Scheme:

<table>
<thead>
<tr>
<th></th>
<th>IA</th>
<th></th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class Test (Practical Based)</td>
<td>Mid Term Viva</td>
<td>Attendance</td>
</tr>
<tr>
<td></td>
<td>15</td>
<td>10</td>
<td>05</td>
</tr>
</tbody>
</table>
COMMUNICATION SKILLS - V

Course Code: BTF 741  
Credit Units: 01

Course Objective:
To facilitate the learner with Academic Language Proficiency and make them effective users of functional language to excel in their profession.

Course Contents:

Module I
Introduction to Public Speaking  
Business Conversation  
Effective Public Speaking  
Art of Persuasion

Module II: Speaking for Employment
Types of Interview  
Styles of Interview  
Facing Interviews-Fundamentals and Practice Session  
Conducting Interviews- Fundamentals and Practice Session  
Question Answer on Various Dimensions

Module III
Resume Writing  
Covering Letters  
Interview Follow Up Letters

Module IV: Basic Telephony Skills
Guidelines for Making a Call  
Guidelines for Answering a Call

Module V: Work Place Speaking
Negotiations  
Participation in Meetings  
Keynote Speeches

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>CAF</th>
<th>V</th>
<th>GD</th>
<th>GP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

CAF – Communication Assessment File  
GD – Group Discussion  
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge  
- Krishnaswamy, N, Creative English for Communication, Macmillan  
- Taylor, Conversation in Practice
Course Objective:
This course aims at enabling students towards:
Understand the importance of individual differences
Better understanding of self in relation to society and nation
Facilitation for a meaningful existence and adjustment in society
Inculcating patriotism and national pride

Course Contents:

Module I: Individual differences & Personality
Personality: Definition & Relevance
Importance of nature & nurture in Personality Development
Importance and Recognition of Individual differences in Personality
Accepting and Managing Individual differences (adjustment mechanisms)
Intuition, Judgment, Perception & Sensation (MBTI)
BIG5 Factors

Module II: Managing Diversity
Defining Diversity
Affirmation Action and Managing Diversity
Increasing Diversity in Work Force
Barriers and Challenges in Managing Diversity

Module III: Socialization
Nature of Socialization
Social Interaction
Interaction of Socialization Process
Contributions to Society and Nation

Module IV: Patriotism and National Pride
Sense of pride and patriotism
Importance of discipline and hard work
Integrity and accountability

Module V: Human Rights, Values and Ethics
Meaning and Importance of human rights
Human rights awareness
Values and Ethics - Learning based on project work on Scriptures like Ramayana, Mahabharata, Gita etc.

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer

Text & References:
- Davis, K. Organizational Behaviour,
- Bates, A. P. and Julian, J.: Sociology - Understanding Social Behaviour
- Dressler, David and Cans, Donald: The Study of Human Interaction
- Robbins O.B. Stephen: Organizational Behaviour
FRENCH - VII

Course Code: BTF 744 Credit Units: 02

Course Objective:
Revise the portion covered in the first volume, give proper orientation in communication and culture.

Course Contents:

Module A: Unités 1 – 3: pp. 06 - 46

Contenu lexical:

Unité 1: Rédiger et présenter son curriculum vitae
Exprimer une opinion
Caractériser, mettre en valeur
Parler des rencontres, des lieux, des gens

Unité 2: Imaginer - Faire des projets
Proposer - conseiller
Parler des qualités et des défauts
Faire une demande écrite
Raconter une anecdote
Améliorer son image

Unité 3: Exprimer la volonté et l’obligation
Formuler des souhaits
Exprimer un manque/un besoin
Parler de l’environnement, des animaux, des catastrophes naturelles

Contenu grammatical:

1. Le passé : passé composé/imparfait
2. Pronoms compléments directs/indirects, y/en (idées/chose)
3. Propositions relatives introduites par qui, que, où
4. Comparatif et superlatif
5. Le conditionnel présent
6. Situer dans le temps
7. Féminin des adjectifs
8. La prise de paroles : expressions
9. Le subjonctif : volonté, obligation

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & Références:

- le livre à suivre : Campus: Tome 2
Course Code: BTF 745  
Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Dass- Sätze
Explain the use of the conjunction “-that”, where verb comes at the end of the sentence

Module II: Indirekte Fragesätze
To explain the usage of the “Question Pronoun” as the Relative Pronoun in a Relative Sentence, where again the verb falls in the last place in that sentence.

Module III: Wenn- Sätze
Equivalent to the conditional “If-” sentence in English. Explain that the verb comes at the end of the sentence.

Module IV: Weil- Sätze
Explain the use of the conjunction “because-” and also tell that the verb falls in the last place in the sentence.

Module V: Comprehension texts
Reading and comprehending various texts to consolidate the usage of the constructions learnt so far in this semester.

Module VI: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture; Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation  
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
Course Code: BTF 746  Credit Units: 02

Course Objective:
To enable students acquire working knowledge of the language; to give them vocabulary, grammar, expressions used on telephonic conversation and other situations to handle everyday Spanish situations with ease.

Course Contents:

Module I
Revision of earlier semester modules

Module II
Zodiac signs. More adjectives…to describe situations, state of minds, surroundings, people and places.

Module III
Various expressions used on telephonic conversation (formal and informal)

Module IV
Being able to read newspaper headlines and extracts (Material to be provided by teacher)

Module V
Negative commands (AR ending verbs)

Module VI
Revision of earlier sessions and introduction to negative ER ending commands, introduction to negative IR ending verbs

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español En Directo I A, 1B
- Español Sin Fronteras
- Material provided by the teacher from various sources
Course Objective:
To enable the students to converse in the language with the help of different speech, possibilities, probabilities etc.
Note: The teaching is done in roman as well as Japanese script. 10 more kanjis (Japanese characters) are taught in this semester.

Course Contents:

Module I: Thought
Expressing one’s thought and intentions on different situations.

Module II: Advice
Giving advice, probability, possibility and suggestions.

Module III: Informal Speech
Addressing friends and close people using informal ways.

Module IV: Simultaneous Verbs
Describing two situations simultaneously.

Module V: Possibility
Explaining the probability and possibility of any situation.

Learning Outcome
➢ Students can interact in a formal as well as informal way on above-mentioned topics.

Methods of Private study/ Self help
➢ Hand-outs, audio-aids, assignments and role-plays will support classroom teaching.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

• Shin Nihon-go no Kiso Lesson No.-31 to 35.
• All vocabulary and topics taught to the students are from the above mentioned book.
Course Objective:
The story of Cinderella first appears in a Chinese book written between 850 and 860 A.D. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
About china part – I Lesson 1,2.

Module II
Pronunciation and intonation
Character Writing and stroke order.

Module III
Ask someone what he/she usually does on weekends?
Visiting people, Party, Meeting, After work….etc.

Module IV
Conversation practice
Translation from English to Chinese and vise-versa.
Short fables.

Module V
A brief summary of grammar.
The optative verb “yuanyi”.
The pronoun “ziji”.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Kan tu shuo hua” Part-I Lesson 1-7
GUIDELINES FOR SUMMER PROJECT
The main objective of Summer Project is to familiarize students to laboratory environment and make them learn to handle equipments and softwares, design experiments and analyze the results. The student will be supervised by one or more faculty members and he or she will be required to submit a synopsis. While writing a synopsis emphasis should be given to make it publishable. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student. Initial drafts should be critiqued by the faculty guide and corrected by the student at each stage. The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include
- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals.
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout
The report should contain the following components:
- TITLE PAGE
- CERTIFICATE
- ACKNOWLEDGEMENT
- ABBREVIATIONS
- CONTENTS WITH PAGE NUMBERS
- CHAPTER –
  a. INTRODUCTION
  b. REVIEW OF LITERATURE
  c. MATERIALS & METHODS
  d. RESULTS & DISCUSSION
  e. SUMMARY AND CONCLUSION
  f. REFERENCES
  g. APPENDIX (OPTIONAL)

- 1 inch Margin on left side & 1”each on other sides.
- Single side of the paper to be used.
- Times New Roman.

Font Size
- 12 (Bold for headings)
- 12 (Normal for Matter)
- 14 (for Chapter Names)
- 1.5 line spacing
- Numbering on the right hand Top of the page
- Numbers on pages before chapters to be done in Roman at the bottom of the page

References
This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

Examples
For Research Article

For Book

- Scientific names in Italics
- Cover Page containing - Title, Students Name, Supervisors Name, University, Name (along with logo), Course name & year of Submission in the prescribed format
- 2 copies to be submitted

**ASSESSMENT OF THE PROJECT FILE**

Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution. Evaluation will compose of two components - Project report assessment and Viva - voce. Project report assessment will be done by the two internal faculty members in respective fields. A committee of three faculty members will conduct Viva-voce. Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project will be assessed as per evaluation format.

**Examination Scheme:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissertation</td>
<td>50</td>
</tr>
<tr>
<td>Viva Voce</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

PRINCIPLES OF MANAGEMENT AND ENTREPRENEURSHIP DEVELOPMENT

Course Code: BTF 801
Credit Units: 03

Course Contents:

Module I
Basic management skills – Planning, Organizing, Developing, Controlling

Module II
Performance Appraisal

Module III
Regulatory issues, Environmental issues

Module IV
Interpersonal skills and Wealth Creation Process

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- The Practice of Management by P. Drucker. Harper Business
PROJECT MANAGEMENT

Course Code: BTF 802 Credit Units: 03

Course Objective:
The emphasis is to impart skills on how to develop a project management plan, identify key milestones and develop delivery plans. Implementation and co-ordination of the project plan with an emphasis on communication and project promotion and monitoring. Major challenge of identifying barriers to implementation and creating deliverable solutions.

Course Contents:

Module I
Introduction – Conceiving a project, Strategic Management and Project Selection

Module II
Project Training – Conflict and Negotiation Developing a project, Appraisal of project – financial, marketing appraisal, technology appraisal and HRD appraisal, Managing the project, Termination/Replacement of project, Project in Contemporary Organizations.

Module III: Project Initiation
Project implementation – Scheduling, Resource Allocation, Monitoring and Information, Project Control

Module IV
Project Termination – Project Auditing and Termination

Module V
Full understanding of project and business management theory in the context of a clinical trial.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:
MOLECULAR MODELING AND DRUG DESIGNING

Course Code: BTF 803  Credit Units: 03

Course Objective:
Molecular modeling and computer graphics are powerful tools in the study of the relationships between molecular structure and biological activity, and thus essential in the process of rational drug design. Different methods of drug designing will be discussed.

Course Contents:

Module I
Introduction to drug designing, drug design to discovery and development, drug metabolism, toxicity and pharmacokinetics, toxicology considerations, problems and drawbacks on drug discovery and development.

Module II
Drug Target classification, identification and validation strategies, Design and development of combinatorial libraries for new lead generation

Module III
Structure-based design – ‘de novo’ design methodologies, 3D-database searching techniques, docking

Module IV
QSAR: Statistical techniques behind QSAR, classical QSAR, molecular descriptors 3D QSAR and COMFA

Module V
Basic principles of molecular modeling, molecular dynamics simulation techniques.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/ Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Principles of molecular modeling by Andrew Leach
- Principles of Medicinal Chemistry by W.O. Foye, T.L. Lemke, and D.A. Williams. Williams and Wilkins
- Essentials of Drug Designing by V. Kothekar
- Drug Design by Cohen
IPR AND REGULATORY ISSUES

Course Code: BTF 803  Credit Units: 03

Course Objective:
It will familiarize the students of the IPR issues and regulatory issues pertaining to health care industries. The unit will also cover the regulatory legislation and associated approvals and permissions required to conduct high-quality single-centre, national and international clinical trials. Ethical issues will be considered throughout the unit.

Course Contents:

Module I

Module II
Rights of Publicity & Moral Rights, IPR at National level, International Protection of Intellectual property, Ethical conflicts with IPR.

Module III
Case studies involving Biotechnology/Bioinformatics cases (e.g., Human genome project, controversial patents like turmeric, neem and basmati rice etc.).

Module IV
Regulatory affairs, good clinical practice and ethics, GMP, cGMP.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT</th>
<th>Attendance</th>
<th>Assignment/Project/Seminar/Quiz</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>70</td>
</tr>
</tbody>
</table>

Text & References:

- Refer to articles and reports in journals on the regulatory issues.
COMMUNICATION SKILLS - VI

Course Code: BTF 841  Credit Units: 01

Course Objective:
The modules are designed to enhance the communicative competence of the learners to equip them with efficient interpersonal communication.

Course Contents:

Module I: Dynamics of Group Discussion
Introduction,
Methodology
Role Functions
Mannerism
Guidelines

Module II: Communication through Electronic Channels
Introduction
Technology based Communication Tools
Video Conferencing
Web Conferencing
Selection of the Effective Tool
E-mails, Fax etc.

Module III: Effective Public Speaking
Types
Essentials
Success in Public Speaking
Dos and Don’ts

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>CAF</th>
<th>V</th>
<th>GD</th>
<th>GP</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>25</td>
<td>10</td>
<td>10</td>
<td>10</td>
<td>5</td>
</tr>
</tbody>
</table>

CAF – Communication Assessment File
GD – Group Discussion
GP – Group Presentation

Text & References:

- Jermy Comfort, Speaking Effectively, et.al, Cambridge
- Krishnaswamy, N, Creative English for Communication, Macmillan
- Taylor, Conversation in Practice
BEHAVIOURAL SCIENCE - VIII
(PERSONAL AND PROFESSIONAL EXCELLENCE)

Course Code: BTF 843
Credit Units: 01

Course Objective:
Importance of Personal and Professional excellence
Inculcating the components of excellence

Course Contents:

Module I: Components of Excellence
Personal Excellence:
Identifying long-term choices and goals
Uncovering the talent, strength & style
Analyzing choke points in your personal processes by analysis in area of placements, events, seminars, conference, extracurricular activities, projects etc.

Module II: Managing Personal Effectiveness
Setting goals to maintain focus
Dimensions of personal effectiveness (self disclosure, openness to feedback and perceptiveness)
Integration of personal and organizational vision for effectiveness
A healthy balance of work and play
Managing Stress creatively and productively

Module III: Personal Success Strategy
Time management
Handling criticism and interruptions
Dealing with difficult people
Mapping and evaluating the situations
Identifying long-term goals

Module IV: Positive Personal Growth
Understanding & Developing positive emotions
Positive approach towards future
Resilience during loss and challenge

Module V: Professional Success
Building independence & interdependence
Reducing resistance to change
Continued reflection (Placements, events, seminars, conferences, projects extracurricular Activities etc.)

Module VI: End-of-Semester Appraisal
Viva based on personal journal
Assessment of Behavioural change as a result of training
Exit Level Rating by Self and Observer
FRENCH - VIII

Course Code: BTF 844  Credit Units: 02

Course Objective:
Provide students with the necessary linguistic tools
• to face up to different situations of communication
• to enhance their capacity in oral/written comprehension/expression

Course Contents:

Module B: Unités 4, 5, 6: PP. 48 - 86

Contenu lexical:

Unité 4:
1. Présenter une information/les circonstances d’un événement
2. Exprimer la possibilité/la probabilité
3. Exprimer une quantité indéfinie
4. Comprendre et raconter un fait div

Unité 5:
1. Parler d’une passion, d’une aventure
2. Choisir/créer
3. Exprimer la surprise/des sentiments

Unité 6:
1. Exprimer la cause et la conséquence
2. Exprimer la crainte et rassurer
3. Faire une démonstration

Contenu grammatical:

1. la construction passive
2. la forme impersonnelle
3. l’interrogation
4. les adjectifs et les pronoms indéfinis
5. les pronoms interrogatifs et démonstratifs
6. la construction avec deux pronoms
7. le subjonctif dans l’expression des sentiments, de la crainte, du but
8. constructions permettant l’expression de la cause et de la conséquence
9. l’enchaînement des idées : succession et opposition

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & Références:

• le livre à suivre : Campus: Tome 2
Course Code: BTF 845  Credit Units: 02

Course Objective:
To enable the students to converse, read and write in the language with the help of the basic rules of grammar, which will later help them to strengthen their language.
To give the students an insight into the culture, geography, political situation and economic opportunities available in Germany
Introduction to Advanced Grammar and Business Language and Professional Jargon

Course Contents:

Module I: Reading and comprehension
Reading texts and comprehending them

Module II: Information about German History
Acquiring information about German History through appropriate texts and stories

Module III: Bio data/Curriculum vitae
Writing a bio-data in the proper format with all essential components

Module IV: Informal letters
Reading and writing informal letters

Module V: Business etiquette
Business etiquette in Germany and types of companies

Module VI: Interview skills
To learn to face interviews
Read a text ‘Interviewspiel’

Module VII: Picture Description
Firstly recognize the persons or things in the picture and identify the situation depicted in the picture;
Secondly answer questions of general meaning in context to the picture and also talk about the personal experiences which come to your mind upon seeing the picture.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Wolfgang Hieber, Lernziel Deutsch
- Hans-Heinrich Wangler, Sprachkurs Deutsch
- Schulz Griesbach, Deutsche Sprachlehre für Ausländer
- P.L Aneja, Deutsch Interessant- 1, 2 & 3
- Rosa-Maria Dallapiazza et al, Tangram Aktuell A1/1,2
- Braun, Nieder, Schmöe, Deutsch als Fremdsprache 1A, Grundkurs
Course Code: BTF 846  
Credit Units: 02

Course Objective:
To enable students to deal with Spanish situations putting things in perspective, using Past Tense. Enabling them to comprehend and form slightly complex sentences. Give students vocabulary of various situations.

Course Contents:

Module I
Situational exercises/Picture Description:
At the cine
At the Chemist’s/Hospital

Module II
At a corporate client’s informal/formal meeting/gathering
Looking for accommodation

Module III
Past Tense (Indefinido) of regular verbs
Past Tense (Indefinido) of irregular verbs
Exercises related to the above

Module IV
Past Tense (Imperfecto)

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Español En Directo I A, 1B
- Español Sin Fronteras
- Material provided by the teacher from various sources
Course Objective:
To enable the students to converse in the language with the help of different forms as volitional forms, active and passive voice and decision making etc.

Note: The course and teaching in Roman as well as Japanese script. Also introducing next 10 to 20 kanjis.

Course Contents:

Module I: Volitional forms
Explaining the situation when one is thinking of doing something.

Module II: Active and Passive voice
Direct and indirect ways of speech.

Module III: Plain Forms
Sentence patterns using plain forms of verb.

Module IV: Causes and effects
Explaining causes and effects with different forms of verb.

Module V: Decision making
Expressing different occupations and how to make decision.

Learning Outcome
➢ Students can speak the language and will be able to express their views and opinions comfortably.

Methods of Private study/ Self help
➢ Hand-outs, audio-aids, assignments and role-plays will support classroom teaching.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- Shin Nihon-go no Kiso Lesson No.-36 to 40.
- All vocabulary and topics taught to the students are from the above mentioned book.
Course Code: BTF 848  Credit Units: 02

Course Objective:
Paper was first invented in China in 105 AD. It was a closely guarded secret and didn’t reach Europe until the 8th Century. The course aims at familiarizing the student with the basic aspects of speaking ability of Mandarin, the language of Mainland China. The course aims at training students in practical skills and nurturing them to interact with a Chinese person.

Course Contents:

Module I
Drills
Dialogue practice
Observe picture and answer the question.
The aspect particle “le” and the modal particle “le”.

Module II
Optative verbs
Texts based on different topics
Enriching vocabulary by dealing with various daily scenarios and situations.

Module III
Sentences with subject predicate construction as its predicate
Pronunciation and intonation
Character writing and stroke order

Module IV
About china Part I Lesson 2,3
Chinese to English and English to Chinese translations from the news paper.

Module V
Questions with an interrogative pronoun
Essays, writing formal letters.
Conversation practice.

Examination Scheme:

<table>
<thead>
<tr>
<th>Components</th>
<th>CT1</th>
<th>CT2</th>
<th>C</th>
<th>I</th>
<th>V</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weightage (%)</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>20</td>
<td>15</td>
<td>5</td>
</tr>
</tbody>
</table>

C – Project + Presentation
I – Interaction/Conversation Practice

Text & References:

- “Kan tu shuo hua” Part-I Lesson 8-13
MOLECULAR MODELING AND DRUG DESIGNING LAB

Course Code: BTF 822
Credit Units: 01

Course Contents:

Module I
Building of Molecules

Module II
Structure based drug design

Module III
QSAR

Module IV
Energy minimisation and simulation techniques.

Examination Scheme:

<table>
<thead>
<tr>
<th>IA</th>
<th>EE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Class Test (Practical Based)</td>
<td>Major Experiment</td>
</tr>
<tr>
<td>Mid Term Viva</td>
<td>Minor Experiment/Spotting</td>
</tr>
<tr>
<td>Attendance</td>
<td>Practical Record</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
</tr>
<tr>
<td>05</td>
<td>10</td>
</tr>
<tr>
<td>35</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>10</td>
</tr>
</tbody>
</table>
GUIDELINES FOR PROJECT/DISSERTATION FILE

Research experience is as close to a professional problem-solving activity as anything in the curriculum. It provides exposure to research methodology and an opportunity to work closely with a faculty guide. It usually requires the use of advanced concepts, a variety of experimental techniques, and state-of-the-art instrumentation.

Research is genuine exploration of the unknown that leads to new knowledge which often warrants publication. But whether or not the results of a research project are publishable, the project should be communicated in the form of a research report written by the student.

Sufficient time should be allowed for satisfactory completion of reports, taking into account that initial drafts should be critiqued by the faculty guide and corrected by the student at each stage.

The File is the principal means by which the work carried out will be assessed and therefore great care should be taken in its preparation.

In general, the File should be comprehensive and include:

- A short account of the activities that were undertaken as part of the project;
- A statement about the extent to which the project has achieved its stated goals;
- A statement about the outcomes of the evaluation and dissemination processes engaged in as part of the project;
- Any activities planned but not yet completed as part of the project, or as a future initiative directly resulting from the project;
- Any problems that have arisen that may be useful to document for future reference.

Report Layout

The report should contain the following components:

- **Title or Cover Page**
  The title page should contain the following information: Project Title; Student’s Name; Course; Year; Supervisor’s Name.

- **Acknowledgements** (optional)
  Acknowledgment to any advisory or financial assistance received in the course of work may be given.

- **Abstract**
  A good "Abstract" should be straight to the point; not too descriptive but fully informative. First paragraph should state what was accomplished with regard to the objectives. The abstract does not have to be an entire summary of the project, but rather a concise summary of the scope and results of the project.

- **Table of Contents**
  Titles and subtitles are to correspond exactly with those in the text.

- **Introduction**
  Here a brief introduction to the problem that is central to the project and an outline of the structure of the rest of the report should be provided. The introduction should aim to catch the imagination of the reader, so excessive details should be avoided.

- **Materials and Methods**
  This section should aim at experimental designs, materials used. Methodology should be mentioned in details including modifications if any.

- **Results and Discussion**
  Present results, discuss and compare these with those from other workers, etc. In writing these section, emphasis should be given on what has been performed and achieved in the course of the work, rather than discuss in detail what is readily available in text books. Avoid abrupt changes in contents from section to section and maintain a lucid flow throughout the thesis. An opening and closing paragraph in every chapter could be included to aid in smooth flow.
Note that in writing the various sections, all figures and tables should as far as possible be next to the associated text, in the same orientation as the main text, numbered, and given appropriate titles or captions. All major equations should also be numbered and unless it is really necessary never write in "point" form.

- **Conclusion**
  A conclusion should be the final section in which the outcome of the work is mentioned briefly.

- **Future prospects**

- **Appendices**
  The Appendix contains material which is of interest to the reader but not an integral part of the thesis and any problem that have arisen that may be useful to document for future reference.

- **References / Bibliography**
  This should include papers and books referred to in the body of the report. These should be ordered alphabetically on the author's surname. The titles of journals preferably should not be abbreviated; if they are, abbreviations must comply with an internationally recognised system.

**Examples**

**For research article**

**For book**

**ASSESSMENT OF THE PROJECT /DISSERTATION FILE**
Essentially, marking will be based on the following criteria: the quality of the report, the technical merit of the project and the project execution.
Technical merit attempts to assess the quality and depth of the intellectual efforts put into the project.
Project execution is concerned with assessing how much work has been put in.
The File should fulfill the following *assessment objectives*:

**Range of Research Methods used to obtain information**
Execution of Research
Data Analysis
Analyse Quantitative/ Qualitative information
Control Quality
Draw Conclusions

**Examination Scheme:**

<table>
<thead>
<tr>
<th>Item</th>
<th>Marks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dissertation</td>
<td>50</td>
</tr>
<tr>
<td>Viva Voce</td>
<td>50</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>