Scheme of Instruction, Examinations and Syllabus relating to

B. Engineering (Aircraft Engineering)
(Twinning Programme offered by Andhra University
in collaboration with Perth College, UK)
(with effect from 2008-2009)

B. Engineering (Aircraft Engineering) - First year – I Semester

<table>
<thead>
<tr>
<th>Sub. code</th>
<th>Subject title</th>
<th>Periods/week</th>
<th>Theory</th>
<th>Practical</th>
<th>Ses. marks</th>
<th>Exam. marks</th>
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<tbody>
<tr>
<td>BSAE111</td>
<td>English (Communication Skills)</td>
<td>5</td>
<td>-</td>
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<tr>
<td>BSAE112</td>
<td>Mathematics</td>
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<td>BSAE114</td>
<td>Engineering Graphics</td>
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<td>BSAE115</td>
<td>Basic Work-shop Skills</td>
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<tr>
<td>BSAE116</td>
<td>Auto CAD</td>
<td>-</td>
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B. Engineering (Aircraft Engineering) - First year – II Semester

<table>
<thead>
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<th>Sub. code</th>
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<tbody>
<tr>
<td>BSAE121</td>
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<td>Aircraft Materials</td>
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<td>Aircraft Propulsion</td>
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<td>BSAE125</td>
<td>Advanced Work-shop Skills</td>
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<td>BSAE126</td>
<td>Basic Electrical &amp; Electronics Lab.</td>
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B. Engineering (Aircraft Engineering) - Second year – I Semester

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<tbody>
<tr>
<td>BSAE211</td>
<td>Aircraft Structures</td>
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<td>Flight Controls</td>
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<td>BSAE213</td>
<td>Aircraft Automatic Flight &amp; Landing Systems</td>
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<td>BSAE215</td>
<td>Aircraft Inspection &amp; Repair</td>
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B. Engineering (Aircraft Engineering) - Second year – II Semester

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<tr>
<td>BSAE221</td>
<td>Aircraft Engineering</td>
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<td>BSAE222</td>
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<td>BSAE223</td>
<td>Aircraft Gas Turbine Engines</td>
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<tr>
<td>BSAE224</td>
<td>Flight Controls</td>
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<td>BSAE225</td>
<td>Data Processing, Transmission and Computer control systems</td>
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### B. Engineering (Aircraft Engineering) - Third year – I Semester

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<tbody>
<tr>
<td>BSAE311</td>
<td>Aircraft Hydraulic &amp; Pneumatic Systems</td>
<td>5</td>
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<td>BSAE312</td>
<td>Modern Aircraft Technology</td>
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<td>BSAE313</td>
<td>Aircraft Electrical Power Systems</td>
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<tr>
<td>BSAE314</td>
<td>Aircraft Landing Gear</td>
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<tr>
<td>BSAE315</td>
<td>Aircraft Maintenance Skills</td>
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<tr>
<td>BSAE316</td>
<td>Aircraft Inspection, Fault Detection and Diagnosis</td>
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### B. Engineering (Aircraft Engineering) - Third year – II Semester

<table>
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<tr>
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<tbody>
<tr>
<td>BSAE321</td>
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<td>BSAE322</td>
<td>Integrated System Analysis</td>
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<td>BSAE323</td>
<td>Aircraft Servo Control Systems</td>
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<td>BSAE324</td>
<td>Human Factors for Aircraft Engineering</td>
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<tr>
<td>BSAE325</td>
<td>Engineering Reliability &amp; Reliability centered Aircraft Maintenance</td>
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<tr>
<td>BSAE326</td>
<td>Aircraft Electrical Power Systems</td>
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### B. Engineering (Aircraft Engineering) - Fourth year – I & II Semesters

<table>
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<tr>
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<th>Exam. marks</th>
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<tbody>
<tr>
<td>BSAE411</td>
<td>Aircraft Engineering Project</td>
<td>Both semesters</td>
<td>200</td>
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</table>
B. Engineering (Aircraft Engineering)
First Year -I Semester

BSAE111   English (Communication Skills)

Periods / week: 5 Th.               Ses.:30   Exam 70
Examination (Theory): 3 Hrs.

1. A TEXT WITH FOCUS ON SKILLS APPROACH
   Intended to develop the language skills of Listening. Speaking, Reading and Writing.

2. VOCABULARY :
   1. One word Substitutes
   2. Synonyms and Antonyms
   3. Common Errors
   4. Idioms and Phrases
   5. Foreign Phrases

3. Writing skills :
   1. Précis writing
   2. Letter writing.
   4. E-Mail etiquette.
   5. Resume Writing.

Text Book Prescribed :
1. In order to improve the proficiency of the student in the acquisition of the above mentioned skills, the following text is prescribed.

     (selected lessons)

The following lessons are prescribed from the above Text:
   I. Astronomy (1)
   II. Humour (4)
   III. Environment (6)
   IV. Inspiration (7)

Reference Books Prescribed :
2. Margaret M Maison, Examine your English, Orient Longman
BSAE112 Mathematics
Periods / week: 5 Th. Ses.: 30 Exam 70
Examination (Theory): 3 Hrs.

Partial Differentiation and its applications:

Multiple integrals and their applications:

Differential Equations Of First Order And Its Applications:

Vector Calculus:
Differentiation of vectors; Curves in space; Velocity and acceleration; Relative velocity and acceleration; Scalar and vector point functions; Vector operator \( \nabla \). \( \nabla \) applied to scalar point functions; Gradient; \( \nabla \) applied to vector point functions; Divergence and Curl. Physical interpretations of \( \nabla F \) and \( \nabla \times F \) applied twice to point functions; \( \nabla \) applied to products of point functions; Integration of vectors; Line integral; Circulation; Work; Surface integral-Flux; Green’s theorem in the plane; Stake’s theorem; Volume integral; Divergence theorem; Irrotational and Solenoidal fields; Green’s theorem; Introduction to orthogonal curvilinear coordinates: Cylindrical; Spherical and polar coordinates.

BSAE113 Physics
Periods / week: 5 Th. Ses.: 30 Exam 70
Examination (Theory): 3 Hrs.

Thermodynamics

Electromagnetism
Concept of electric flux, Gauss law- some applications, Coulomb’s law from Gauss law, electric potential and field strength, potential due to a point charge and dipole. Magnetic field – magnetic force on current, torque on current loop, Hall effect, Ampere’s law, B near a long wire, B for a solenoid. The Biot-Savart,s Law. B for a circular Current loop.
Maxwells equations (qualitative treatment).

**Optics**
Diffraction – Single slit (Qualitative and quantitative treatment).  
Polarisation – Polarisation by reflection, refraction and double refraction in uniaxial crystals, Nicol prism, Quarter and Half wave plate, circular and elliptical polarization and detection.

**Lasers and Fibre Optics and Nano Technology**
Spontaneous and stimulated emissions, population inversions, Ruby laser, Gas laser, Semiconductor laser, Applications of lasers.  
Structure of Optical Fibre, Total Internal Reflection, Acceptance Angle and cone of a fibre, Numerical aperture, types of Optical Fibres, Fibre optics in communications and its advantages.  
Nanotechnology (Basic Concepts only) and its Applications.

**Books Recommended**
1) Engineering Physics by R.K. Gaur and S.D. Gupta  
2) Physics by David Halliday and Robert Resnick – Part I and Part II  
3) Engineering Physics By M.N. Avadhanulu & P.G.Kshirsagar.(S.Chand)

**Reference Books:**
1) Physics for Engineers – M.R.Srinivasan  
2) Engineering Physics – M.Armugam  
3) Moderen Engineering Physics by A.S. Vadudeva

**BSAE114  Engineering Graphics**
Periods / week: 2 Th., Pr. 3                        Ses.:30   Exam 70  
Examination (Theory): 3 Hrs.

**Introduction:**
Drawing Instruments and uses. Lettering scales in common use.  

**Curves:**
Curves used in Engineering Practice, conic sections, construction of conics by different methods, rectangular-hyperbola, cycloidal curves, epi and hypo-cycloids. Involutes and Archmedian spiral.  

**Projections of Points and Straight Lines:**
Projection of points, projection of straight lines,  

**Projections of Planes:**
Projection of planes and projection on auxiliary planes.  

**Projections Solids and Developments:**
Projection of solids in simple positions, projection of solids with axis inclined to one of the reference planes and parallel to the other, projection of solids with axis inclined to both the reference planes.  

**Sections and Developments:**
Sections of different solids and true shape of sections. Development of surfaces of solids. Development of transition piece connecting a square and circular pipe.
Intersections:
Intersection of surfaces-simple problems with prisms and cylinders

Isometric Projections:
Isometric projections, and conversion of orthographic projection into isometric projection.

Textbook:
1. Elements of Engineering Drawing by N.D. Bhatt

Reference:

BSAE115 Basic Work- shop Skills
Periods / week: Pr. 3                                                        Ses.:50 Exam :50
Examination (Practical): 3 Hrs.

1. Carpentry – Three jobs
2. Fitting – Three jobs
3. Tin Smithy – Three jobs
4. Welding – Three jobs
5. Use of Power Tools – Two jobs

BSAE116 AutoCAD
Periods / week: Pr. 3                                                        Ses.:50 Exam :50
Examination (Practical): 3 Hrs.

1. Basic AutoCAD commands
2. Dimensioning
3. 2D Examples
4. Conversion from 2D to 3 D

BSAE 125 Advanced Work- shop Skills

II Semester:
1. Lathe
   a. Plain and Step turning
   b. Taper turning, Grooving and Knurling
   c. Right and Left hand threading
2. Shaper:
   a. Hexagon shaping
   b. Key ways (Different Types)
3. Drilling: Drilling, Reaming and Tapping
4. Milling: Spur Gear
5. Grinding: Surface Grinding and Centre less Grinding
6. Moulding: Two Jobs
7. Forging: Two Jobs