

K.L.N. COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING
Course Outcomes, PO & PSO Mapping – Regulation 2013

ANNA UNIVERSITY, CHENNAI - AFFILIATED INSTITUTIONS
R – 2013 - B. E. ELECTRICAL AND ELECTRONICS ENGINEERING
I TO VIII SEMESTERS CURRICULUM

| S.NO | SEMESTER | SUBJECT CODE | COURSE CODE | NAME OF THE COURSE |
|------|----------|--------------|-------------|---------------------------------------------------|
| 1. | I | HS6151 | C101 | Technical English - I |
| 2. | | MA6151 | C102 | Mathematics - I |
| 3. | | PH6151 | C103 | Engineering Physics - I |
| 4. | | CY6151 | C104 | Engineering Chemistry - I |
| 5. | | GE6151 | C105 | Computer Programming |
| 6. | | GE6152 | C106 | Engineering Graphics |
| 7. | | GE6161 | C107 | Computer Practices Laboratory |
| 8. | | GE6162 | C108 | Engineering Practices Laboratory |
| 9. | | GE6163 | C109 | Physics and Chemistry Laboratory - I |
| 10. | II | HS6251 | C110 | Technical English - II |
| 11. | | MA6251 | C111 | Mathematics - II |
| 12. | | PH6251 | C112 | Engineering Physics - II |
| 13. | | CY6251 | C113 | Engineering Chemistry - II |
| 14. | | GE6251 | C114A | Basic Civil and Mechanical Engineering |
| 15. | | EE6201 | C115A | Circuit Theory |
| 16. | | GE6262 | C116 | Physics and Chemistry Laboratory - II |
| 17. | | GE6263 | C117A | Computer Programming Laboratory |
| 18. | | EE6211 | C118A | Electric Circuits Laboratory |
| 19. | III | MA6351 | C201 | Transforms and Partial Differential Equations |
| 20. | | EE6301 | C202 | Digital Logic Circuits |
| 21. | | EE6302 | C203 | Electromagnetic Theory |
| 22. | | GE6351 | C204 | Environmental Science and Engineering |
| 23. | | EC6202 | C205 | Electronic Devices and Circuits |
| 24. | | EE6303 | C206 | Linear Integrated Circuits and Applications |
| 25. | | EC6361 | C207 | Electronics Laboratory |
| 26. | | EE6311 | C208 | Linear and Digital Integrated Circuits Laboratory |
| 27. | IV | MA6459 | C209 | Numerical Methods |
| 28. | | EE6401 | C210 | Electrical Machines – I |
| 29. | | CS6456 | C211 | Object Oriented Programming |
| 30. | | EE6402 | C212 | Transmission and Distribution |
| 31. | | EE6403 | C213 | Discrete Time Systems and Signal Processing |
| 32. | | EE6404 | C214 | Measurements and Instrumentation |
| 33. | | CS6461 | C215 | Object Oriented Programming Laboratory |
| 34. | | EE6411 | C216 | Electrical Machines Laboratory – I |

| S.NO | SEMESTER | SUBJECT CODE | COURSE CODE | NAME OF THE COURSE |
|------|----------|--------------|-------------|----------------------------------------------------------------|
| 35. | V | EE6501 | C301 | Power System Analysis |
| 36. | | EE6502 | C302 | Microprocessors and Microcontrollers |
| 37. | | ME6701 | C303 | Power Plant Engineering |
| 38. | | EE6503 | C304 | Power Electronics |
| 39. | | EE6504 | C305 | Electrical Machines – II |
| 40. | | IC6501 | C306 | Control Systems |
| 41. | | EE6511 | C307 | Control and Instrumentation Laboratory |
| 42. | | GE6563 | C308 | Communication Skills - Laboratory Based |
| 43. | | EE6512 | C309 | Electrical Machines Laboratory – II |
| 44. | | VI | EC6651 | C310 |
| 45. | EE6601 | | C311 | Solid State Drives |
| 46. | EE6602 | | C312 | Embedded Systems |
| 47. | EE6603 | | C313 | Power System Operation and Control |
| 48. | EE6604 | | C314 | Design of Electrical Machines |
| 49. | EE6002 | | C315E3 | Elective – I – Power System Transients |
| 50. | EE6611 | | C316 | Power Electronics and Drives Laboratory |
| 51. | EE6612 | | C317 | Microprocessors and Microcontrollers Laboratory |
| 52. | EE6613 | | C318 | Presentation Skills and Technical Seminar |
| 53. | VII | EE6701 | C401 | High Voltage Engineering |
| 54. | | EE6702 | C402 | Protection and Switchgear |
| 55. | | EE6703 | C403 | Special Electrical Machines |
| 56. | | MG6851 | C404 | Principles of Management |
| 57. | | EI6704 | C405E2 | Elective – II – Biomedical Instrumentation |
| 58. | | EE6005 | C405E4 | Elective – II – Power Quality |
| 59. | | EE6004 | C405E3 | Elective – II – Flexible AC Transmission Systems |
| 60. | | EE6008 | C406E4 | Elective – III – Microcontroller Based System Design |
| 61. | | EE6711 | C407 | Power System Simulation Laboratory |
| 62. | | EE6712 | C408 | Comprehension |
| 63. | VIII | EE6801 | C409 | Electric Energy Generation, Utilization and Conservation |
| 64. | | EE6009 | C410E1 | Elective – IV – Power Electronics for Renewable Energy Systems |
| 65. | | GE6757 | C411E2 | Elective – V – Total Quality Management |
| 66. | | EE6811 | C412 | Project Work |

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C101 | - | 1 | - | - | - | - | 1 | - | 2 | 2 | - | 1 | 1 | 1 | 1 |
| C102 | 2 | 2 | - | - | 2 | - | - | - | - | - | - | 1 | 2 | 1 | - |
| C103 | 2 | 2 | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - |
| C104 | 2 | 2 | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - |
| C105 | 2 | 3 | - | - | 1 | - | - | - | - | - | - | 1 | 1 | 1 | - |
| C106 | 1 | 2 | - | - | - | 1 | - | - | - | 1 | - | - | 1 | - | 1 |
| C107 | 1 | 3 | - | - | - | - | - | - | 1 | - | - | 1 | 1 | 1 | - |
| C108 | 1 | 1 | 1 | - | 1 | - | - | - | 1 | - | - | 1 | 1 | 1 | - |
| C109 | 3 | 1 | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| C110 | - | 1 | - | - | - | - | 1 | - | 2 | 2 | - | 1 | 1 | 1 | 1 |
| C111 | 2 | - | - | 2 | - | - | - | - | 2 | - | - | 1 | 1 | 1 | - |
| C112 | 2 | 2 | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - |
| C113 | 2 | 2 | - | - | - | - | - | - | - | - | - | 1 | 1 | - | - |
| C114A | 2 | 1 | 1 | - | - | 1 | 2 | - | - | - | - | - | 1 | - | 1 |
| C115A | 3 | 2 | 1 | 1 | 1 | - | - | - | - | - | - | - | 2 | - | - |
| C116 | 3 | - | - | - | - | - | - | - | - | - | - | - | 1 | - | - |
| C117 | 1 | - | 2 | - | 2 | - | - | - | 1 | - | - | - | 1 | 1 | - |
| C118A | 3 | 1 | 2 | - | 1 | 1 | - | - | 2 | - | - | - | 2 | 1 | - |
| C201 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | - | 1 | - | - |
| C202 | 2 | 2 | 2 | 1 | - | - | - | - | - | - | - | - | 2 | - | - |
| C203 | 3 | 3 | 1 | 1 | - | - | - | - | - | - | - | - | 2 | - | - |
| C204 | - | - | - | - | - | 3 | 1 | 1 | 1 | - | - | 3 | - | 1 | 1 |
| C205 | 2 | 2 | 2 | 2 | - | 1 | - | - | - | - | - | - | 2 | - | - |
| C206 | 2 | 1 | 1 | - | - | 1 | - | - | - | - | - | 1 | 1 | - | - |

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C207 | 2 | 1 | 2 | 3 | 1 | - | - | - | 2 | - | - | - | 2 | 1 | - |
| C208 | 2 | - | 1 | - | - | 1 | - | - | 2 | - | - | - | 1 | 1 | - |
| C209 | 3 | 3 | - | 2 | 3 | 2 | - | - | - | - | - | - | 2 | 1 | 1 |
| C210 | 3 | 2 | - | 1 | 1 | - | - | - | - | - | - | - | 1 | - | - |
| C211 | 2 | 1 | 2 | 2 | 2 | - | - | - | - | - | - | - | 2 | 1 | - |
| C212 | 3 | 3 | - | 1 | - | 2 | 2 | - | - | - | - | - | 2 | - | 1 |
| C213 | 3 | 2 | 2 | - | 1 | - | - | - | - | - | - | 1 | 2 | 1 | - |
| C214 | 2 | 1 | 1 | - | - | - | - | - | - | - | - | - | 1 | - | - |
| C215 | 2 | 2 | 2 | 2 | 1 | - | - | - | 1 | - | - | - | 2 | 1 | - |
| C216 | 2 | - | - | 3 | 1 | - | - | - | 1 | - | - | - | 1 | 1 | - |
| C301 | 2 | 3 | - | 2 | 1 | 1 | 1 | - | - | - | - | - | 2 | - | - |
| C302 | 2 | 2 | 2 | - | 1 | - | - | - | - | - | - | - | 2 | - | - |
| C303 | 3 | - | 2 | - | - | 2 | 2 | - | - | - | - | - | 1 | - | 1 |
| C304 | 3 | 2 | 1 | - | 2 | - | - | - | - | - | - | - | 2 | 1 | - |
| C305 | 2 | 3 | 1 | 3 | - | - | - | - | - | - | - | - | 2 | - | - |
| C306 | 3 | 2 | 3 | 1 | - | - | - | - | 2 | - | - | - | 2 | 1 | - |
| C307 | 3 | 1 | 2 | 3 | 2 | - | - | - | 2 | - | - | - | 2 | 1 | - |
| C308 | - | - | 1 | 1 | 1 | 1 | 3 | 1 | 1 | 2 | 1 | 1 | - | - | 1 |
| C309 | 2 | 2 | 1 | 3 | - | - | - | - | 1 | - | - | - | 2 | - | - |
| C310 | 3 | 2 | 1 | 1 | 2 | 1 | 1 | - | - | - | 1 | - | 2 | 1 | 1 |
| C311 | 3 | 1 | - | 1 | - | - | - | - | - | - | - | - | 2 | - | - |
| C312 | 2 | 1 | 1 | 1 | 1 | - | - | - | - | - | - | - | 1 | - | - |
| C313 | 3 | 2 | 1 | 2 | 1 | - | - | - | - | - | - | - | 2 | - | - |
| C314 | 3 | 3 | 3 | - | 2 | - | - | - | - | - | - | - | 2 | 1 | - |
| C315E3 | 3 | 2 | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - |
| C316 | 2 | 1 | 1 | 1 | 1 | - | - | - | 2 | - | - | - | 1 | 1 | - |
| C317 | 2 | 2 | 2 | 3 | 1 | - | - | - | 1 | - | - | - | 2 | 1 | - |

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C318 | 1 | 2 | 2 | 3 | - | - | - | - | 3 | 1 | - | - | 2 | 1 | - |
| C401 | 1 | 1 | - | 2 | - | 2 | - | - | - | - | - | - | 1 | - | 1 |
| C402 | 3 | 2 | 1 | - | - | 1 | 1 | - | - | - | - | - | 2 | - | 1 |
| C403 | 3 | 2 | -- | - | 1 | - | - | - | - | - | - | - | 1 | - | - |
| C404 | - | - | - | 3 | - | 2 | 2 | - | 1 | - | 3 | 3 | 1 | 1 | 1 |
| C405E2 | 3 | - | - | - | 1 | - | 1 | - | - | - | - | - | 1 | - | - |
| C406E4 | 2 | 1 | 1 | 1 | - | 1 | - | - | - | - | - | - | 2 | 1 | 2 |
| C407 | 3 | 2 | 1 | 3 | 1 | - | - | - | - | - | - | - | 2 | - | - |
| C408 | 1 | - | 2 | 3 | - | 1 | 3 | 2 | 1 | - | 1 | 2 | 2 | 1 | 1 |
| C409 | 3 | 2 | 2 | - | - | 1 | 1 | - | - | - | 1 | - | 2 | - | 1 |
| C410E1 | 3 | 3 | - | - | - | 2 | 2 | 2 | - | - | 2 | 2 | 2 | 2 | 1 |
| C411E2 | - | - | - | 2 | - | 1 | 2 | 1 | - | - | 3 | 3 | 1 | 1 | 1 |
| C412 | 2 | 2 | 1 | 2 | 2 | 2 | 2 | 1 | 1 | 1 | 2 | 2 | 2 | 2 | 2 |

Internal Test, Assignment, Seminar, Quiz, Tutorial Marks:

| S. No | Roll No. | AU Grade | COURSE OUTCOMES | | | | | | | | | | | | | | | | | |
|-------|----------|----------|-----------------|----|-----|---------|----|-----|---------|----|----|-----|---------|----|----|-----|---------|----|----|-----|
| | | | C 205.1 | | | C 205.2 | | | C 205.3 | | | | C 205.4 | | | | C 205.5 | | | |
| | | | IT1 | A1 | TU1 | IT2 | A2 | TU2 | IT3 | A3 | Q1 | TU3 | IT4 | A4 | S1 | TU4 | IT5 | S2 | Q2 | TU5 |
| | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | |

Summary of Course Outcome Internal Assessment Calculation:

| Internal Test (IT) | Assignment(A) | Tutorial(T) | Seminar(S)/ Quiz(Q) | Others (O) | Formula for Internal Assessment (IA) |
|--------------------|---------------|-------------|---------------------|------------|-----------------------------------------------|
| √ | | | | | IA = IT |
| √ | | | | √ | IA = 0.8XIT + 0.2XO |
| √ | | | √ | | IA = 0.8XIT + 0.2XS/Q |
| √ | | | √ | √ | IA = 0.7XIT + 0.2XS/Q + 0.1XO |
| √ | | √ | | | IA = 0.7XIT + 0.3XT |
| √ | | √ | | √ | IA = 0.7XIT + 0.2XT + 0.1XO |
| √ | | √ | √ | | IA = 0.7XIT + 0.2XT + 0.1XS/Q |
| √ | | √ | √ | √ | IA = 0.6XIT + 0.2XT + 0.1XS/Q + 0.1XO |
| √ | √ | | | | IA = 0.7XIT + 0.3XA |
| √ | √ | | | √ | IA = 0.7XIT + 0.2XA + 0.1XO |
| √ | √ | | √ | | IA = 0.7XIT + 0.2XA + 0.1XS/Q |
| √ | √ | | √ | √ | IA = 0.6XIT + 0.2XA + 0.1XS/Q + 0.1XO |
| √ | √ | √ | | | IA = 0.6XIT + 0.2XA + 0.2XT |
| √ | √ | √ | | √ | IA = 0.6XIT + 0.1XA + 0.2XT + 0.1XO |
| √ | √ | √ | √ | | IA = 0.6XIT + 0.1XA + 0.2XT + 0.1XS/Q |
| √ | √ | √ | √ | √ | IA = 0.6XIT + 0.1XA + 0.1XT + 0.1XS/Q + 0.1XO |

BenchMark(BM) for attainment Level calculation

| Level | Internal test | Assignment | Tutorial | Seminar/Quiz/Others | AU GRADE | SURVEY |
|-------|-------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------|
| 3 | If 80% of students secured 60% & above marks (BM1 T) | If 80% of students secured 80% & above marks (BM1 A) | If 80% of students secured 65% & above marks (BM1 TUT) | If 80% of students secured 65% & above marks (BM1 S/Q/O) | If 80% of students secured Grade C & above (BM1 AUG) | If the survey is 80% & above (BM1 SU) |
| 2 | If 70% of students secured 60% & above marks (BM2 T) | If 70% of students secured 80% & above marks (BM2 A) | If 70% of students secured 65% & above marks (BM2 TUT) | If 70% of students secured 65% & above marks (BM2 S/Q/O) | If 70% of students secured Grade C & above (BM2 AUG) | If the survey is 70% & above (BM2 SU) |
| 1 | If 60% of students secured 60% & above marks (BM3 T) | If 60% of students secured 80% & above marks (BM3 A) | If 60% of students secured 65% & above marks (BM3 TUT) | If 60% of students secured 65% & above marks (BM3 S/Q/O) | If 60% of students secured Grade C & above (BM3 AUG) | If the survey is 60% & above (BM3 SU) |
| 0 | If less than 60% of students secured 60% & above marks | If less than 60% of students secured 80% & above marks | If less than 60% of students secured 65% & above marks | If less than 60% of students secured 65% & above marks | If less than 60% of students secured Grade C & above | If the survey is less than 60% |

Direct Attainment = $0.6 \times AU + 0.4 \times IA$; [AU=Anna University Grade, IA = Internal Assessment]

Over all Attainment = $0.8 \times \text{Direct Attainment} + 0.2 \times \text{Survey}$

**K.L.N. COLLEGE OF ENGINEERING
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING**

**CO,PO,PSO attainment calculation
Academic year 2015-2016 (ODD Semester)**

| | | | |
|----------------|-----------------------------|----------------|-------------------------|
| Degree/Program | : B.E./EEE | Course Name | : COMPUTER PROGRAMMING |
| Duration | : August'15 to November '15 | Course code | : GE6151 (C105) |
| Year/Semester | : I/I | Staff Handling | : R. Divya & M. Senbaga |
| Regulation | : 2013 | Batch | : 2015 - 2019 |

Table 1. COURSE OUTCOMES: After the course, the student should be able to:

| Course | Course Outcome |
|--------|--------------------------------------------------------------------------------------------------------------------------|
| C105.1 | Explain the basic organization of computers, the number systems and write the pseudo code for algorithms and flow chart. |
| C105.2 | Develop 'C' Programming fundamentals, looping statements and solve problems. |
| C105.3 | Design 'C' Programs for arrays and strings. |
| C105.4 | Use functions with pass by value and reference, pointers in programs. |
| C105.5 | Develop codings in 'C' for structures and unions with storage classes and preprocessor. |

Table 2. CO – PO, PSO mapping:

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C105.1 | 3 | 3 | - | - | 1 | 1 | - | - | - | - | - | - | 2 | - | - |
| C105.2 | 3 | 3 | - | - | 1 | - | - | - | - | - | - | 1 | 2 | 1 | - |
| C105.3 | 2 | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 | 1 | - |
| C105.4 | 2 | 3 | - | - | - | - | - | - | - | - | - | 2 | 1 | 1 | - |
| C105.5 | 2 | 3 | - | - | 1 | - | - | - | - | - | - | 2 | 1 | 1 | - |
| C105 | 2 | 3 | - | - | 1 | - | - | - | - | - | - | 1 | 1 | 1 | - |

Table 3. Content beyond the syllabus:

| Content Beyond Syllabus Added(CBS) | POs strengthened / vacant filled | CO / Unit |
|--------------------------------------------------|----------------------------------|------------|
| Computer Booting Process and its functionalities | PO3(1) & PO12(1)(vacant filled) | C105.1 / I |

Note: 1.Effectiveness of CBS should be obtained suitably (Internal test/ Quiz / Survey on CBS exclusively). Evidence should be kept in the course file.

2. Assignment questions, internal questions should be asked to test the learning level of the students.

Table 4. Internal test (IT), Assignment (A), Seminar (S), Quiz (Q), Tutorial Marks (T):

| S. No | Roll No. | AU grade | Course Outcomes | | | | | | | | | | | |
|-------|----------|----------|-----------------|-----|-----|--------|-----|----|--------|----|--------|----|--------|----|
| | | | C105.1 | | | C105.2 | | | C105.3 | | C105.4 | | C105.5 | |
| | | | IT | A | S | IT | A | Q | IT | A | IT | Q | IT | S |
| 1. | 152060 | B | 96 | 100 | 100 | 100 | 100 | 90 | 95 | 90 | 94 | 80 | 95 | 90 |
| 2. | 152077 | C | 76 | 100 | 100 | 92 | 100 | 80 | 71 | 90 | 94 | 90 | 95 | 80 |
| 3. | 152044 | E | 80 | 100 | 80 | 60 | 90 | 60 | 62 | 70 | 44 | 70 | 62 | 70 |
| 4. | 152037 | A | 98 | 100 | 80 | 54 | 90 | 80 | 81 | 90 | 75 | 80 | 95 | 80 |
| 5. | 152305 | E | 68 | 100 | 80 | 36 | 100 | 70 | 52 | 90 | 57 | 80 | 57 | 70 |
| 6. | 152021 | E | 82 | 100 | 90 | 62 | 90 | 70 | 79 | 70 | 75 | 80 | 86 | 70 |
| 7. | 152032 | E | 36 | 70 | 80 | 44 | 80 | 70 | 67 | 90 | 69 | 90 | 57 | 50 |
| 8. | 152050 | U | 72 | 90 | 70 | 32 | 90 | 80 | 36 | 70 | 69 | 70 | 14 | 70 |
| 9. | 152016 | E | AA | 100 | 80 | AA | 90 | 80 | 76 | 80 | 69 | 90 | 71 | 70 |
| 10. | 152051 | B | 88 | 80 | 100 | 48 | 70 | 90 | 93 | 90 | 100 | 80 | 95 | 90 |
| 11. | 152019 | B | 82 | 100 | 80 | 86 | 90 | 90 | 86 | 90 | 88 | 90 | 95 | AA |
| 12. | 152062 | E | 44 | 90 | 80 | 56 | 100 | 70 | 64 | 80 | 69 | 80 | 76 | 70 |
| 13. | 152048 | U | 74 | 80 | 100 | 62 | 80 | 70 | 60 | 70 | 44 | 80 | 14 | 70 |
| 14. | 152079 | E | 72 | 80 | 90 | 40 | 90 | 70 | 76 | 80 | 57 | 80 | 52 | AA |
| 15. | 152013 | E | 88 | 80 | 80 | 28 | 90 | 70 | 71 | 70 | 75 | 70 | 86 | 60 |
| 16. | 152070 | E | 94 | 50 | 100 | 70 | 80 | 80 | 71 | 70 | 63 | 90 | 57 | 70 |
| 17. | 152011 | C | 82 | 100 | 90 | 58 | 100 | 90 | 71 | 80 | 94 | 80 | 81 | 80 |
| 18. | 152004 | E | 64 | 100 | 90 | 56 | 90 | 70 | 67 | 70 | 32 | 80 | 33 | 70 |
| 19. | 152039 | E | 60 | 90 | 90 | 92 | 100 | AA | 88 | 90 | 57 | 90 | 86 | 80 |
| 20. | 152083 | U | 52 | 90 | 90 | 32 | 70 | 70 | 45 | 70 | 38 | 70 | 05 | 60 |
| 21. | 152017 | D | 82 | 100 | 90 | 50 | 90 | AA | 81 | 90 | 100 | 80 | 71 | 70 |
| 22. | 152046 | E | 64 | 80 | 90 | 64 | 80 | 80 | 64 | 70 | 63 | 80 | 62 | 70 |
| 23. | 152059 | E | 86 | 100 | 90 | 50 | 90 | AA | 86 | 80 | 94 | 70 | 86 | 70 |
| 24. | 152026 | B | 100 | 100 | 90 | 80 | 90 | 80 | 90 | 80 | 88 | 90 | 95 | 80 |
| 25. | 152052 | C | 84 | 80 | 90 | 80 | 90 | 80 | 88 | 90 | 82 | 90 | 95 | 80 |
| 26. | 152304 | C | 72 | 80 | 80 | 84 | 80 | 70 | 79 | 80 | 75 | 70 | 86 | 70 |

| | | | | | | | | | | | | | | |
|-----|--------|---|-----|-----|----|-----|-----|----|----|----|-----|----|----|----|
| 27. | 152047 | D | 48 | 80 | 80 | 28 | 70 | 90 | 64 | 70 | 63 | 70 | 81 | 60 |
| 28. | 152003 | B | 98 | 100 | 90 | 90 | 100 | 90 | AA | 90 | AA | 90 | 95 | 90 |
| 29. | 152045 | E | 68 | 100 | AA | 80 | 100 | 90 | 88 | 80 | 100 | 80 | 95 | 80 |
| 30. | 152042 | C | 92 | 100 | 90 | 92 | 100 | 80 | 90 | 90 | 100 | 90 | 86 | 90 |
| 31. | 152065 | E | 92 | 100 | 90 | 76 | 100 | 80 | 74 | 80 | 100 | 80 | 90 | 80 |
| 32. | 152035 | E | 72 | 100 | 90 | 68 | 90 | 90 | 74 | 80 | 50 | 80 | 62 | 80 |
| 33. | 152074 | B | 96 | 100 | 90 | 100 | 100 | 80 | 81 | 90 | 94 | 90 | 95 | 90 |
| 34. | 152041 | C | 84 | 90 | 90 | 84 | 90 | 80 | 88 | 80 | 94 | 80 | 86 | 80 |
| 35. | 152034 | D | 85 | 90 | 90 | 34 | 80 | 80 | 50 | 80 | 94 | 80 | 86 | 80 |
| 36. | 152014 | C | 84 | 100 | 90 | 84 | 90 | 90 | 86 | 90 | 94 | 80 | 90 | 80 |
| 37. | 152058 | E | 84 | 80 | 90 | 72 | 100 | 90 | 83 | 90 | 88 | 90 | 86 | 80 |
| 38. | 152008 | A | 82 | 100 | 80 | 90 | 100 | 80 | 90 | 80 | 100 | 80 | 90 | AA |
| 39. | 152054 | E | 48 | 80 | 70 | 24 | 100 | 70 | 62 | 70 | 63 | 80 | 33 | 60 |
| 40. | 152002 | C | 100 | 100 | 90 | 84 | 100 | 90 | 93 | 90 | 100 | 90 | 95 | AA |
| 41. | 152005 | E | 84 | 100 | 90 | 96 | 100 | 90 | 86 | 90 | 88 | 90 | 95 | AA |
| 42. | 152018 | A | 92 | 100 | 90 | 88 | 100 | 90 | 90 | 90 | 94 | 90 | 86 | 90 |
| 43. | 152301 | B | 96 | 70 | 70 | 68 | 100 | 80 | 62 | 70 | 82 | 70 | 86 | AA |
| 44. | 152068 | D | 93 | 80 | 90 | 62 | 90 | AA | 81 | 90 | 88 | 90 | 76 | 80 |
| 45. | 152055 | C | 84 | 100 | 90 | 92 | 100 | 80 | 86 | 90 | 100 | 70 | 90 | 70 |
| 46. | 152033 | E | 92 | 100 | 90 | 76 | 90 | 80 | 78 | 70 | 62 | 90 | 80 | 80 |
| 47. | 152084 | D | 80 | 100 | 70 | 38 | 80 | 80 | 85 | 70 | 100 | 80 | 60 | 70 |
| 48. | 152007 | D | 93 | 100 | 70 | 76 | 70 | 70 | 80 | 60 | 100 | 60 | 68 | 90 |
| 49. | 152064 | E | 80 | 100 | 80 | 56 | 70 | 80 | 71 | 80 | 75 | 70 | 88 | 90 |
| 50. | 152057 | E | 68 | 100 | 90 | 60 | 70 | 80 | 64 | 60 | 62 | 90 | 84 | 70 |
| 51. | 152102 | U | 66 | 100 | 70 | 68 | 80 | 90 | 78 | 60 | 50 | 60 | 88 | 70 |
| 52. | 152071 | B | 88 | 100 | 90 | 18 | 70 | 70 | 66 | 90 | 75 | 90 | 84 | 80 |
| 53. | 152076 | E | 76 | 100 | 80 | 15 | 90 | 80 | 80 | 80 | 37 | 70 | 64 | 80 |
| 54. | 152303 | E | 24 | 100 | 60 | 72 | 80 | 80 | 64 | 60 | 100 | 80 | 92 | 90 |

| | | | | | | | | | | | | | | |
|-----|--------|---|-----|-----|-----|-----|----|----|----|----|-----|----|----|----|
| 55. | 152040 | E | 84 | 100 | 70 | 56 | 80 | 90 | 78 | 70 | 62 | 60 | 76 | 80 |
| 56. | 152001 | B | 100 | 100 | 60 | 92 | 70 | 80 | 83 | 80 | 75 | 70 | 88 | 90 |
| 57. | 152049 | E | 88 | 100 | 90 | 16 | 80 | 70 | 45 | 80 | 75 | 70 | 88 | 70 |
| 58. | 152030 | E | 84 | 100 | 70 | 64 | 80 | 70 | 73 | 70 | 62 | 80 | 84 | 90 |
| 59. | 152006 | A | 100 | 100 | 80 | 84 | 90 | 80 | 85 | 90 | 50 | 90 | 88 | 90 |
| 60. | 152103 | E | 12 | 100 | 80 | 64 | 80 | 60 | 54 | 60 | 62 | 90 | 80 | AA |
| 61. | 152078 | E | 92 | 100 | 70 | 12 | 70 | 90 | 80 | 80 | 50 | 70 | 96 | 70 |
| 62. | 152009 | D | 64 | 100 | 60 | 100 | 80 | 60 | 61 | 90 | 75 | 90 | 68 | 70 |
| 63. | 152015 | E | 76 | 100 | 70 | 72 | 50 | 70 | 61 | 70 | 56 | 70 | 57 | 80 |
| 64. | 152061 | B | 80 | 100 | 70 | 80 | 70 | 70 | 88 | 80 | 100 | 80 | 88 | 70 |
| 65. | 152302 | E | 88 | 100 | 70 | 48 | 80 | 90 | 83 | 70 | 75 | 70 | 96 | 90 |
| 66. | 152053 | E | 80 | 100 | 80 | 44 | 70 | 70 | 73 | 80 | 62 | 80 | 52 | 70 |
| 67. | 152043 | E | 16 | 90 | 90 | 60 | 80 | 70 | 69 | 60 | 50 | 60 | 68 | 70 |
| 68. | 152066 | C | 84 | 100 | 100 | 88 | 80 | 60 | 83 | 90 | 75 | 70 | 76 | 70 |
| 69. | 152029 | B | 92 | 100 | 70 | 96 | 90 | 90 | 88 | 60 | 100 | 70 | 80 | 80 |
| 70. | 152056 | E | 88 | 100 | 60 | 84 | 70 | 70 | 78 | 60 | 87 | 60 | 84 | 70 |
| 71. | 152075 | D | 68 | 100 | 60 | 68 | 80 | 90 | 83 | 80 | 75 | 70 | 80 | 70 |
| 72. | 152080 | E | 88 | 100 | 60 | 40 | 90 | 80 | 83 | 80 | 87 | 70 | 84 | 70 |
| 73. | 152022 | D | 84 | 100 | 70 | 88 | 80 | 80 | 80 | 80 | 62 | 90 | 84 | 90 |
| 74. | 152063 | C | 88 | 100 | 80 | 96 | 90 | 90 | 59 | 90 | 25 | 90 | 84 | 90 |
| 75. | 152036 | C | 92 | 100 | 90 | 60 | 80 | 80 | 92 | 70 | 75 | 80 | 60 | 90 |
| 76. | 152069 | A | 84 | 100 | AA | 96 | 80 | 90 | 92 | 70 | 100 | 80 | 95 | 70 |
| 77. | 152028 | B | 88 | 100 | 80 | 96 | 70 | 90 | 83 | 80 | 100 | 80 | 84 | 70 |
| 78. | 152031 | E | 80 | 100 | 80 | 52 | 60 | 60 | 80 | 70 | 100 | 70 | 76 | 90 |
| 79. | 152027 | C | 76 | 100 | 90 | 96 | 80 | 70 | 85 | 70 | 75 | 90 | 92 | 70 |
| 80. | 152023 | D | 36 | 100 | 90 | 68 | 70 | 90 | 57 | 70 | 100 | 70 | 80 | 80 |
| 81. | 152073 | E | 60 | 100 | 70 | 96 | 70 | 70 | 80 | 80 | 100 | 80 | 72 | 60 |
| 82. | 152082 | E | 84 | 100 | 80 | 76 | 80 | 60 | 80 | 80 | 87 | 70 | 80 | 90 |

| | | | | | | | | | | | | | | |
|----------------------------------------|--------|---|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 83. | 152020 | E | 60 | 100 | 90 | 80 | 50 | 80 | 76 | 80 | 87 | 70 | 72 | 80 |
| 84. | 152101 | E | 76 | 100 | 100 | 52 | 70 | 90 | 73 | 70 | 0 | 80 | 64 | 60 |
| 85. | 152081 | E | 68 | 100 | 60 | 36 | 70 | 80 | 52 | 70 | 25 | 90 | 68 | 100 |
| 86. | 152012 | E | 84 | 100 | 60 | 56 | 80 | 70 | 85 | 70 | 87 | 80 | 80 | 90 |
| 87. | 152067 | B | 23 | 100 | 60 | 68 | 80 | 90 | 90 | 80 | 87 | 80 | 80 | 80 |
| 88. | 152038 | C | 88 | 100 | 90 | 96 | 80 | 70 | 92 | 90 | 100 | 70 | 96 | 90 |
| 89. | 152025 | D | 88 | 100 | 70 | 84 | 80 | 80 | 80 | 80 | 87 | 60 | 80 | 70 |
| % of Students secured Benchmark1 (BM1) | | | 88.6% | 96.6% | 89.7% | | | 92.9% | 89.8% | | 80.7% | 93.3% | 87.6% | 91.5% |
| Benchmark 2 (BM2) | | | | | | | 77.5% | | | | | | | |
| Benchmark 3 (BM3) | | | | | | 65.9% | | | | 61.8% | | | | |
| *ATM level (3 or 2 or 1 or 0) | 0 | 3 | 3 | 3 | 3 | 1 | 2 | 3 | 3 | 1 | 3 | 3 | 3 | 3 |

Table 5. *ATM level criteria:

| Level | Internal test | Assignment | Tutorial | Seminar/Quiz/Others | AU GRADE | SURVEY |
|-------|-------------------------------------------------------------|-------------------------------------------------------------|---------------------------------------------------------------|-----------------------------------------------------------------|-------------------------------------------------------------|----------------------------------------------|
| 3 | If 80% of students secured 60% & above marks (BM1 T) | If 80% of students secured 80% & above marks (BM1 A) | If 80% of students secured 65% & above marks (BM1 TUT) | If 80% of students secured 65% & above marks (BM1 S/Q/O) | If 80% of students secured Grade C & above (BM1 AUG) | If the survey is 80% & above (BM1 SU) |
| 2 | If 70% of students secured 60% & above marks (BM2 T) | If 70% of students secured 80% & above marks (BM2 A) | If 70% of students secured 65% & above marks (BM2 TUT) | If 70% of students secured 65% & above marks (BM2 S/Q/O) | If 70% of students secured Grade C & above (BM2 AUG) | If the survey is 70% & above (BM2 SU) |
| 1 | If 60% of students secured 60% & above marks (BM3 T) | If 60% of students secured 80% & above marks (BM3 A) | If 60% of students secured 65% & above marks (BM3 TUT) | If 60% of students secured 65% & above marks (BM3 S/Q/O) | If 60% of students secured Grade C & above (BM3 AUG) | If the survey is 60% & above (BM3 SU) |
| 0 | If less than 60% of students secured 60% & above marks | If less than 60% of students secured 80% & above marks | If less than 60% of students secured 65% & above marks | If less than 60% of students secured 65% & above marks | If less than 60% of students secured Grade C & above | If the survey is less than 60% |

Table 6. Course outcome attainment (based on internal & AU assessment) [Mark the level 3 or 2 or 1 or 0]:

| Course Outcomes | Internal Test | A | Tut | S | Q | IA* | AU Grade | ATM* (Direct) | Survey | *Overall ATM |
|-----------------|---------------|---|-----|---|---|-----|----------|---------------|--------|--------------|
| C105.1 | 3 | 3 | - | 3 | - | 3 | 0 | 1.2 | 3 | 1.56 |
| C105.2 | 1 | 2 | - | - | 3 | 1.4 | 0 | 0.56 | 3 | 1.05 |
| C105.3 | 3 | 1 | - | - | - | 2.4 | 0 | 0.96 | 3 | 1.37 |
| C105.4 | 3 | - | - | - | 3 | 3 | 0 | 1.2 | 3 | 1.56 |
| C105.5 | 3 | - | - | 3 | - | 3 | 0 | 1.2 | 3 | 1.56 |
| C105 (Avg)# | | | | | | | | | | 1.42 |

$$C105 (Avg)\# = [C105.1+ C105.2+ C105.3+ C105.4+ C105.5]/5$$

$$ATM* (Direct) = 0.6XAU+0.4XIA$$

$$*Over all ATM =0.8X ATM (Direct) + 0.2 X Survey$$

Table 7. Internal assessment criteria (IA*):

| Internal Test | A | Tut | S/Q | Others | Formula for Internal Assessment (IA*) |
|---------------|---|-----|-----|--------|------------------------------------------|
| √ | | | | | IT |
| √ | | | | √ | 0.8XIT + 0.2XO |
| √ | | | √ | | 0.8XIT + 0.2XS/Q |
| √ | | | √ | √ | 0.7XIT + 0.2XS/Q + 0.1XO |
| √ | | √ | | | 0.7XIT + 0.3XT |
| √ | | √ | | √ | 0.7XIT + 0.2XT + 0.1XO |
| √ | | √ | √ | | 0.7XIT + 0.2XT + 0.1XS/Q |
| √ | | √ | √ | √ | 0.6XIT + 0.2XT + 0.1XS/Q+ 0.1XO |
| √ | √ | | | | 0.7XIT + 0.3XA |
| √ | √ | | | √ | 0.7XIT + 0.2XA + 0.1 X O |
| √ | √ | | √ | | 0.7XIT + 0.2XA + 0.1XS/Q |
| √ | √ | | √ | √ | 0.6XIT + 0.2XA + 0.1XS/Q + 0.1XO |
| √ | √ | √ | | | 0.6XIT + 0.2XA + 0.2XT |
| √ | √ | √ | | √ | 0.6XIT + 0.1XA + 0.2XT + 0.1XO |
| √ | √ | √ | √ | | 0.6XIT + 0.1XA + 0.2XT + 0.1XS/Q |
| √ | √ | √ | √ | √ | 0.6XIT + 0.1XA + 0.1XT + 0.1XS/Q + 0.1XO |

√ - If conducted use the corresponding formula for internal assessment.

Table 8 (A). C – PO, PSO mapping:

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|------|------|------|------|------|
| C105 | 2 | 3 | - | - | 1 | - | - | - | - | - | - | 1 | 1 | 1 | - |

Table 8 (B). C – PO, PSO attainment:

| Course | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 | PO11 | PO12 | PSO1 | PSO2 | PSO3 |
|--------|------|------|-----|-----|------|-----|-----|-----|-----|------|------|------|------|------|------|
| C105 | 1.42 | 1.42 | - | - | 1.42 | - | - | - | - | - | - | 1.42 | 1.42 | 1.42 | - |

Table 9. Course outcome attainment - Observations / Action Plan taken for improvement :

| Course outcome attainment & Observations | | | Action Plan | Remarks by HOD (Follow up on implementation) |
|------------------------------------------|----------------------------------------|----------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| CO | Overall ATM (Taken from table no.6) | Observations | | |
| C105.1 | 1.56 | a. Anna University Examination : Performance of students is Poor. | a. Remedial Classes will be Conducted. b. Important AU questions will be discussed. c. Presentation techniques in AU Examinations for better performance will be stressed. | |
| C105.2 | 1.05 | a. Internal Test Attainment is low. b. Anna University Examination :Performance of students is Poor. | a. Retest will be Conducted. b. Additional periods will be included in the lecture schedule. | |
| C105.3 | 1.37 | a. Attainment for Assignment is Low. b. Anna University Examination: Performance of students is Poor. | a. Assignment questions will be revised. b. Students will be Counseled. | |
| C105.4 | 1.56 | a. Anna University Examination: Performance of students is Poor. | a. Remedial Classes/Retest will be Conducted. b. Additional Course material will be issued. | |
| C105.5 | 1.56 | a. Anna University Examination: Performance of students is Poor. | a. Students will be Counseled. | |

Note: 1. Observations and actions to be taken should be filled up, if the ATM level is less than 2.

2. Action Plan to be implemented in the forth coming academic year & should be implemented. Evidence for action taken should be reflected in the lecture schedule/ course file / Monograph/ course delivery file / Handouts / Seminars / Guest lectures / Increase in Tutorial hours / Model demonstration/ Additional periods in the lecture schedule /Assignment/ Remedial classes/ Retest/Student counselor diary/ Counseling record in the assessment records / etc.,

Signature of the Faculty

HOD/EEE

Continuous improvement - Effectiveness on action plan taken and remarks :

Table 10. Course outcome attainment comparison (2014-2015, 2015-2016, 2016-2017):

| Course Outcomes | 2014-2015 | 2015-2016 | 2016-2017 |
|------------------------|------------------|------------------|------------------|
| C105.1 | 0.89 | 1.56 | |
| C105.2 | 0.89 | 1.05 | |
| C105.3 | 1.04 | 1.37 | |
| C105.4 | 1.04 | 1.56 | |
| C105.5 | 1.36 | 1.56 | |
| C105 (Avg)# | 1.04 | 1.42 | |
| Remarks by HOD | | | |