

ARUSHA TECHNICAL COLLEGE



COLLEGE INDUSTRIAL PRACTICAL TRAINING REGULATIONS AND GUIDELINES

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ABBREVIATIONS

| | |
|-----|-------------------------------|
| ATC | Arusha Technical College |
| IPT | Industrial Practical Training |
| ILO | Industrial Liaison Officer |
| NTA | National Technical Awards |

1.0 INTRODUCTION

As a requirement every student studying for an ordinary diploma in Engineering/Sciences or Bachelor's degree in Engineering has to undergo Industrial Practical Training (IPT) for duration of ten weeks. The training is aimed at giving students exposure to the profession in the real world of work as well as provide them with opportunities to correlate their theoretical understanding and the reality of the profession.

Students in NTA levels 4 to 6 do their IPT after the 2nd semester of their academic year while Bachelor of Engineering students (NTA levels 7) do their IPT after 2nd and 4th semesters of their academic year respectively. Students in NTA level 8 do not go for IPT.

2.0 OBJECTIVES OF IPT

2.1 Main Objective of IPT

The main objective of IPT is to promote the development of appropriate technology that meets national, regional and international needs through skills and practical-oriented training, research and consultancy.

2.2 Specific Objectives of IPT

Specific objectives for IPT are to:

- a) Expose students to the work and its environment related to their profession
- b) Provide opportunities for students to acquire working experience in an industry/organization related to their field of study
- c) Assist the students to practise lifelong learning when they return to the College
- d) Train students to interact and communicate effectively at every level in the working situation
- e) Train students to write technical reports after they have undergone the IPT
- f) Develop group work camaraderie
- g) Appreciate and internalize professional ethics
- h) Develop collaborations between the College and the industry

3.0 INDUSTRIAL PRACTICAL TRAINING STRUCTURE AND OUTCOMES

3.1 Industrial Practical Training Structure

Table 3.1 summarizes the IPT credits and duration for NTA levels 4 to 7.

| Qualification Level | Time Recommended | IPT Module | Credit Values | Duration (Weeks) |
|----------------------------|---------------------------------|-------------------|----------------------|-------------------------|
| NTA Level 4 | End of 2 nd Semester | IPT 04 | 10 | 10 |
| NTA Level 5 | End of 2 nd Semester | IPT 05 | 10 | 10 |
| NTA Level 6 | End of 2 nd Semester | IPT 06 | 10 | 10 |
| NTA Level 7 | End of 2 nd Semester | IPT 07-1 | 12 | 10 |
| | End of 4 th Semester | IPT 07- 2 | 12 | 10 |

Table 3.1: IPT credits and duration

3.2 Industrial Practical Training Outcomes

Upon completion of the IPT, students will be able to:

- a) Practice knowledge and skills learned with minimum supervision
- b) Identify the structure of departments in the organization/industry of the training venue as well as learn about the various positions and their roles in the organization
- c) Interact and communicate effectively with different groups of people
- d) Solve some of the practical problems professionally
- e) Exhibit ethics and integrity whilst carrying out the given responsibilities
- f) Work effectively and manage oneself or others
- g) Complete assignments as per deadlines
- h) Produce a detailed technical report based on the given format

4.0 SCOPE OF IPT

The College shall draft the scope of the training based on the curriculum of the academic program to facilitate the industry/organization in their effort to plan the training programs for the students. However, the organization/industry has the option to amend the scope of the training program to suit their activities and needs which

should be in accordance with the scope determined by the College. The scope of the IPT program is intended to provide:

- a) Exposure to different types of jobs in the industry/organization by performing tasks such as data collection, testing, fixing and managing equipment, designing, developing systems, managing resources etc. while under supervision
- b) Understanding of the whole process and operational system such as production operation, evaluation and analysis
- c) Training in management and administration.

5.0 IPT PLACEMENT, ALLOWANCES/LOANS AND CONDUCT

5.1 IPT Placement and Allowances/Loans

- a) The College will provide as many suitable places as possible for all eligible students to do their IPT. A student may solicit for IPT placements through the College and be allocated accordingly.
- b) The allocation of IPT places shall be done by the College and be published not later than the commencement of the IPT session.
- c) Sponsors of NTAs 4-8 students shall pay IPT allowances/loans either directly to the students or through the College

5.2 Conduct of IPT

5.2.1 IPT arrival note and relocation to a new IPT place

While on Industrial Practical Training:

- a) The arrival note (appendix 1) shall be filled in and sent by the student as registered mail so as to reach the College not later than the fourth week of the IPT period. The arrival note can also be downloaded from College website.
- b) Failure to send the arrival note on time without justifiable reasons would mean failure in that IPT module.
- c) Where necessary, a student may be relocated to a new IPT place by the ILO at the request of the student or IPT supervisor and should be done before the end of fourth week of the IPT period.

- d) Each student will be visited at least once by the IPT supervisor from the College.
If visited more than once then the supervisor should be different.

5.2.2 The logbook

- a) The logbook serves as the only formal record of the student's Industrial Practical Training performance and should be well looked after.

- b) Logging of tasks (filling the logbook)

The following guidelines must be adhered to in filling the IPT logbook:

- i) Student's name, College supervisor's name and signature, as well as the Industrial Supervisor's name and signature must be filled in all pages. The industrial supervisor also affixes the official stamp on all pages.
- ii) The task description must be pre-fixed by key words e.g. fabrication, design/drawing, maintenance, problem solving, etc.
- iii) The duration (time in hours) must be logged next to each category.
- iv) The task must briefly describe the student's activity in performing the task.
- v) The student must not give description of processes or machine functions, instead should describe own tasks/performance.

- c) The IPT logbook comments

Logbook comments serve as a link between the industry, student and supervisor. They can be used as a basis for visitation, follow up, action, etc. For example:

- i) Comments can be made about the student's learning experience in relation to the tasks described by both the student and his/her supervisor.
 - ii) Problems or shortcomings, which may affect the learning experience, may be highlighted.
 - iii) Student can make suggestions or recommendations on his/her involvement in the task performed.
- d) All students must make sure that their logbooks are signed and rubber-stamped by the respective Industrial Practical Training supervisor at least on weekly basis. Failure to do so, the logbook will be considered incomplete, implying failure in that IPT session.

6.0 IPT ASSESSMENT

- a) IPT logbooks and College supervisor's report should be handed in to the respective Heads of Departments within the first two weeks of the first semester after IPT session.
- b) Failure to submit IPT logbooks to the Heads of Departments within the first two weeks of the first semester after IPT session without justifiable reasons would mean failure in that IPT module.
- c) Failure to attend at least 80% of the IPT session will mean failure in that IPT module.
- d) The Final assessment shall be carried out by the respective Department not later than four weeks before the end of the first semester after IPT session.
- e) IPT results shall be presented by the respective Head of Department to the College Academic Committee for approval and published as provisional results one week before the end of the first semester after IPT session or otherwise as directed by the Academic Committee.
- f) A student who fails in any IPT module for reasons including failure of 5.2.2 (b), 6.0 (b) and 6.0 (c) shall be required to repeat the IPT session at own cost.
- g) A student shall be considered to have failed the IPT if he/she does not comply with the respective Examination Regulations.
- h) A student who does not go to the allocated IPT place without any written permission of the ILO will be considered to have absconded and shall be discontinued from studies.
- i) The logbook will be retained by the respective Department for a period of at least one academic year after successful completion of the IPT module.
- j) Students who only report to the IPT places and disappears shortly thereafter shall be considered to have absconded and shall be discontinued from studies.
- k) Students who do not follow rules and instructions of the IPT place shall be discontinued from studies.

7.0 IPT SUPERVISION AND RESPONSIBILITIES

7.1 Supervision Timing and Tools

- a) Supervision of students in their IPT places shall preferably be conducted between the fourth and eight week of the IPT period.
- b) The College supervisor shall carry with him/her the following:
 - i) Official introductory note from the Rector
 - ii) Student's Arrival Note (Appendix 1) or list of students with detailed information of where they are doing IPT.
 - iii) Students' Assessment forms (Appendix 2 and 3).
 - iv) Training programmes where available.
 - v) Any other relevant materials.
- c) The supervision of students will be done by selected academic staff from the College.

7.2 Student's Responsibilities

- a) Register for Industrial Practical Training at the respective Department by the fourth week of the first semester.
- b) Report to the IPT place without failure on the date of commencement of IPT.
- c) Abide by the policies, procedures and regulations of the IPT place.
- d) Abide by the occupational health and safety rules.
- e) Conduct himself/herself in a professional and ethical manner throughout the IPT process.
- f) Contact the office of the ILO immediately in case of difficulties.
- g) Ensure that the logbook is evaluated by the IPT supervisor on a weekly basis.
- h) Prepare and collect necessary documentation and reports required for students' evaluation.
- i) Identify and document training experiences and skills acquired.
- j) Keep daily records of reporting and departure times accordingly.

7.3 College IPT Supervisor's Responsibilities

- a) On arrival at the industry, the College IPT supervisor shall contact the IPT Training supervisor at the respective firm.
- b) The College IPT Supervisor shall:
 - i) Discuss with the IPT supervisor about the student's training programme and performance.
 - ii) Check and counter sign the student's logbooks.
 - iii) Discuss with each student on the IPT training and give guidance as appropriate.
 - iv) Fill in the students' assessment forms.

7.4 Industry Supervisor's Responsibilities

The Industrial IPT supervisor is expected to:

- a) Provide an orientation to familiarize the incoming student with the industry expectations.
- b) Discuss with a student her/his IPT training programme and expected outcomes at the beginning of the IPT training session.
- c) Provide the student with meaningful training related to his/her field of study in productive work rather than merely observation.
- d) Evaluate the student's work by means of the logbook.
- e) Provide an overall evaluation of the student's performance and competency at the end of IPT training using a standard form (Appendix 4).
- f) Ensure the student abides by the company policies, procedures, rules and regulations.

8.0 EVALUATION GUIDELINES

8.1 Skills assessment

Student's skills and competency will be assessed by the IPT supervisors according to the criteria set in the IPT Supervisors' Assessment Forms.

8.2 Logbook assessment

- a) The student's logbook serves as a record of all tasks performed.
- b) The logbook evaluation will be based on:
 - i) Use of the proposed format and correct filling in of log sheets.
 - ii) Assessment of the logged tasks by Industrial supervisor.
 - iii) Neatness of the logbook, including handwriting and correctness, relevance and diagrammatic presentation.
 - iv) Technical report

Technical Report for NTAs 4-6

Requirements of technical report for NTAs 4-6 programmes are:

- The report must describe the organization of the workplace and its operations (general part)
- The student should choose a problem/challenge at the respective IPT place, study, analyze, propose solution and look for impact if implemented

Technical Report for NTAs 7-8

Requirements of technical report for NTAs 7-8 programmes are:

- The report must describe the organization of the workplace and its operations (general part).
- The student should choose a problem/challenge at the respective IPT place, study, analyze, propose solution and look for impact if implemented.
- The student in consultation with the industrial supervisor should identify a challenge(s) at the respective IPT place for which a student could work as a final year project. This could also provide consultancy opportunity for the College to come up with a technical solution.

- c) The assessment of the logbook shall be done by appointed academic staff from the respective Department.

Oral presentation

Upon completion their IPT, all students except NTA level 6 are required to do oral presentation of their work (in power point) two weeks after submission of their logbooks to the College.

Each student will be required to prepare her/his presentation as follows:

a) Introduction:

- i) Particulars of the student
- ii) Information of the undertaking/place of IPT
- iii) Particulars of College and industrial supervisors

b) Activity performed

- i) Brief overview of the undertaking
- ii) Activities performed during IPT
- iii) Interesting findings
- iv) Challenges/problems faced if any
- v) How the student solved the challenges

c) Conclusion and Recommendations

- i) Suitability of IPT place
- ii) What should be added/removed from curriculum

9.0 DISTRIBUTION OF MARKS AND GRADING OF SCORES

9.1 Distribution of marks

The final assessment of the Industrial Practical Training shall include all the elements mentioned above and the distribution of marks is summarized in Table 2.

Table 2: Distribution of marks

| S/NO | Elements | | Marks | | |
|--------------|--------------------------------|------------------|-------------|-------------|-------------|
| | | | NTA 4-5 | NTA 6 | NTA 7 |
| 1 | College Supervisor's Report | | 5% | 10% | 5% |
| 2 | Industrial Supervisor's Report | | 5% | 10% | 5% |
| 3 | Oral Presentation | | 15% | * | 25% |
| 4 | Logbook | Daily Summary | 20% | 10% | 10% |
| | | Weekly Summary | 25% | 25% | 10% |
| | | Technical Report | 30% | 45% | 45% |
| Total | | | 100% | 100% | 100% |

*Due to logistical intricacies, NTA 6 students are exempted from oral presentation.

9.2 Grading of Scores

All assessment work shall be graded according to the ranges of score given in Table 3

Table 3: Ranges of scores for different grades as per College Examinations Regulations

| NTA Levels 4-5 | | | NTA Levels 6 | | | NTA Level 7 - 8 | | |
|----------------|------------------------|-------------|--------------|--------------------------------|-------------|-----------------|--------------------------------|-------------|
| Grade | Definition | Score Range | Grade | Definition | Score Range | Grade | Definition | Score Range |
| A | Excellent | 80-100 | A | Excellent | 75-100 | A | Excellent | 70-100 |
| | | | B+ | Well Above Average (Very Good) | 65-74 | B+ | Well Above Average (Very Good) | 60-69 |
| B | Above Average (Good) | 65-79 | B | Above Average (Good) | 55-64 | B | Above Average (Good) | 50-59 |
| C | Average (Satisfactory) | 50-64 | C | Average (Satisfactory) | 45-54 | C | Average (Satisfactory) | 40-49 |
| D | Below Average (Poor) | 40-49 | D | Below Average (Poor) | 35-44 | D | Below Average (Poor) | 35-39 |
| F | Failure | 0-39 | F | Failure | 0-34 | F | Failure | 0-34 |
| I | Incomplete | - | I | Incomplete | - | I | Incomplete | - |

10.0 AMENDMENTS

Amendments on IPT and guidelines shall be done from time to time as deemed necessary by the College Academic Committee.

APENDIX 1: ARRIVAL NOTE
ARUSHA TECHNICAL COLLEGE

Principal
Arusha Technical College
P. O. Box 296
ARUSHA

INDUSTRIAL PRACTICAL TRAINING ARRIVAL NOTE

PART: A. (To be completed by the student)

Name of the student.....Adm. No.....
Academic year.....NTA level.....Department.....
Industrial Practical Training module..... From.....to.....
This is to inform you that I have reported and have been accepted for the training at (name of the undertaking).....
The site/ undertaking is located at*

.....

.....

.....

.....

I am under the supervision of Mr/Mrs/Miss/Dr/Prof.....
who is the (designation).....
Date.....Mob Tel No Signature

PART: B: To be completed by the Training Officer/ Personnel Officer or Officer In charge).

We have received the student and advise you to contact (Name of responsible person)during your visit to our enterprise/company for students supervision.

Date..... Signature.....



*Give a short description of where the site or undertaking is located (a location map can be attached).

APENDIX 2: COLLEGE SUPERVISOR`S REPORT FORM-A

ARUSHA TECHNICAL COLLEGE

NAME OF THE COMPANY/UNDERTAKING.....

NAME OF COLLEGE SUPERVISOR.....

NAME OF STUDENT.....

Student`s Adm. No.....NTA Level.....Module..... Department.....

A: DISCUSSION WITH THE MANAGEMENT:

From the discussion with the management who dealt with students complete the form below

| | Max Score % | Actual Score % |
|--|----------------|-------------------|
| 1. Ability to execute jobs assigned to him/her intelligently and with integrity..... | 10 | |
| 2. Work habits (punctuality, attendance)..... | 10 | |
| 3. Ability to work well with his co-workers, foreman and management..... | 10 | |
| 4. Attitude towards practical work..... | 10 | |
| 5. Good and hard working | 50 | |
| Sub total | | |

B: DISCUSSION WITH THE STUDENT:

| | Max Score % | Actual Score % |
|--|----------------|-------------------|
| 1. Neatness, cleanness and up to date reporting in the logbook..... | 10 | |
| 2. Ability to understand what he/she has done..... | 10 | |
| 3. Ability to understand what he/she has written..... | 10 | |
| 4. Ability to express himself /herself confidently and systematically..... | 10 | |
| 5. Interest or eagerness to learn new skills and knowledge..... | 10 | |
| Sub Total | 50 | |
| Grand Total (A+B) | 100 | |

C: COLLEGE SUPERVISOR`S VIEWS:

1. What problems is the student experiencing (other than financial problems).
.....
2. What is the financial position of the student? Is there any financial help the student is getting from the undertaking?.....
3. What problems is the management getting from the student?.....

.....

 4. From your observations on student’s training, company activities, discussion with the management or students give a brief report, comments or suggestions on areas that need to be added or removed from the three years Ordinary Diploma Course in Engineering (NTA Level 4 – NTA Level 6) syllabus in order to improve or update it.

5. General views including: (a) Suitability of the working place.
 (b) Recommendation on where the student should be placed for his/her next IPT

I hereby declare that the information contained here-in is complete and correct to the best of my knowledge.

College Supervisor’s name.....

Signature.....Date.....

| NTA Levels 4-5 | | | NTA Levels 6 | | | NTA Level 7 - 8 | | |
|----------------|------------------------|-------------|--------------|--------------------------------|-------------|-----------------|--------------------------------|-------------|
| Grade | Definition | Score Range | Grade | Definition | Score Range | Grade | Definition | Score Range |
| A | Excellent | 80-100 | A | Excellent | 75-100 | A | Excellent | 70-100 |
| | | | B+ | Well Above Average (Very Good) | 65-74 | B+ | Well Above Average (Very Good) | 60-69 |
| B | Above Average (Good) | 65-79 | B | Above Average (Good) | 55-64 | B | Above Average (Good) | 50-59 |
| C | Average (Satisfactory) | 50-64 | C | Average (Satisfactory) | 45-54 | C | Average (Satisfactory) | 40-49 |
| D | Below Average (Poor) | 40-49 | D | Below Average (Poor) | 35-44 | D | Below Average (Poor) | 35-39 |
| F | Failure | 0-39 | F | Failure | 0-34 | F | Failure | 0-34 |
| I | Incomplete | - | I | Incomplete | - | I | Incomplete | - |

APENDIX 3: COLLEGE SUPERVISOR'S REPORT FORM-B

ARUSHA TECHNICAL COLLEGE

NAME OF THE COMPANY/UNDERTAKING.....

The following students were supervised by
(name of college supervisor) on (Date): from.....
to..... (Time)

| S/No | Adm. No. | Name | Department | NTA-level | Signature |
|------|----------|------|------------|-----------|-----------|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | | | |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | | | | |
| 9 | | | | | |
| 10 | | | | | |
| 11 | | | | | |

College Supervisor's Name.....

Signatures

Industrial Supervisor's Name.....Tel No.....

Signature..... Date.....

Official stamp of industry.....

APENDIX 4: INDUSTRIAL SUPERVISOR'S REPORT

ARUSHA TECHNICAL COLLEGE

To: Employer/Company

I request you to give us your first hand assessment of our student on the given points below:

NAME OF TRAINING OFFICER.

NAME OF STUDENT.....

Student's Adm. No.....NTA

Level.....Module.....Department.....

A: ASSESSMENT:

| | Max Score % | Actual Score % |
|---|----------------|-------------------|
| 1. Ability on planning and carrying out assigned job..... | 10 | |
| 2. Selection and handling of proper tools..... | 10 | |
| 3. Execution of assigned job..... | 10 | |
| 4. Finished job - tidiness and accuracy..... | 10 | |
| 5. Self confidence..... | 10 | |
| 6. Cooperation with other members of staff..... | 10 | |
| 7. Attendance and punctuality..... | 10 | |
| 8. Obedience..... | 10 | |
| 9. Initiative (self drive)..... | 10 | |
| 10. Willingness to learn..... | 10 | |
| Total | 100 | |

B: GENERAL INFORMATION (Fill the space provided without awarding marks).

1. What date did the trainee report to you company.....
2. What date did the trainee finish the training program?.....
3. How many days did the trainee not attend the training?
 - (a) With your permission.....
 - (b) Without your permission.....
4. What is your general opinion about trainee's skills and attitudes?.....

.....

5. What is your opinion on the adequacy of our training at the college?.....

.....

I declare that the information contained here-in is complete and correct to the best of my knowledge.

Assessing officer's name and qualifications.....

DateSignature

Official stamp of the industry

NB: Please fill this form and send it to the College Principal through the assessed student dully filled and inserted in an **envelope confidentially sealed and stamped.**

The awarding of marks is given under the following grading

| NTA Levels 4-5 | | | NTA Levels 6 | | | NTA Level 7 - 8 | | |
|----------------|------------------------|-------------|--------------|--------------------------------|-------------|-----------------|--------------------------------|-------------|
| Grade | Definition | Score Range | Grade | Definition | Score Range | Grade | Definition | Score Range |
| A | Excellent | 80-100 | A | Excellent | 75-100 | A | Excellent | 70-100 |
| | | | B+ | Well Above Average (Very Good) | 65-74 | B+ | Well Above Average (Very Good) | 60-69 |
| B | Above Average (Good) | 65-79 | B | Above Average (Good) | 55-64 | B | Above Average (Good) | 50-59 |
| C | Average (Satisfactory) | 50-64 | C | Average (Satisfactory) | 45-54 | C | Average (Satisfactory) | 40-49 |
| D | Below Average (Poor) | 40-49 | D | Below Average (Poor) | 35-44 | D | Below Average (Poor) | 35-39 |
| F | Failure | 0-39 | F | Failure | 0-34 | F | Failure | 0-34 |
| I | Incomplete | - | I | Incomplete | - | I | Incomplete | - |

APENDIX 5: INDUSTRIAL PRACTICAL TRAINING ASSESSMENT REPORT

ARUSHA TECHNICAL COLLEGE

DEPARTMENT.....
NTA LEVEL 4
 MODULE CODE.....

ACADEMIC YEAR.....
 DATE OF REPORTING.....

| NO | STUDENTS NAMES. | ADM NO | COLLEGE SUPERVISOR'S REPORT 05% | INDUSTRIAL SUPERVISOR'S REPORT 05% | ORAL PRESENTATION 15% | LOGBOOK | | | TOTAL 100% | GRADE | REMARKS |
|-----|-----------------|--------|------------------------------------|---------------------------------------|-----------------------|-------------------|--------------------|----------------------|------------|-------|---------|
| | | | | | | DAILY SUMMARY 20% | WEEKLY SUMMARY 25% | TECHNICAL REPORT 30% | | | |
| 1. | | | | | | | | | | | |
| 2. | | | | | | | | | | | |
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| 25. | | | | | | | | | | | |
| 26. | | | | | | | | | | | |
| 27. | | | | | | | | | | | |

Signature of Examiner.....

Signature of ILO.....

Name of examiner.....

Name of ILO.....

ARUSHA TECHNICAL COLLEGE

INDUSTRIAL PRACTICAL TRAINING ASSESSMENT REPORT

DEPARTMENT.....

ACADEMIC YEAR.....

NTA LEVEL 5

DATE OF REPORTING.....

MODULE CODE.....

| NO | STUDENTS NAMES. | ADM NO | COLLEGE SUPERVISOR'S REPORT 05% | INDUSTRIAL SUPERVISOR'S REPORT 05% | ORAL PRESENTATION 15% | LOGBOOK | | | TOTAL 100% | GRADE | REMARKS |
|-----|-----------------|--------|------------------------------------|---------------------------------------|-----------------------|-------------------|--------------------|----------------------|------------|-------|---------|
| | | | | | | DAILY SUMMARY 10% | WEEKLY SUMMARY 20% | TECHNICAL REPORT 45% | | | |
| 1. | | | | | | | | | | | |
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Signature of Examiner.....

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ARUSHA TECHNICAL COLLEGE

INDUSTRIAL PRACTICAL TRAINING ASSESSMENT REPORT

DEPARTMENT.....
NTA LEVEL 6
 MODULE CODE.....

ACADEMIC YEAR.....
 DATE OF REPORTING.....

| NO | STUDENTS NAMES. | ADM NO | COLLEGE SUPERVISOR'S REPORT 10% | INDUSTRIAL SUPERVISOR'S REPORT 10% | LOGBOOK | | | TOTAL 100% | GRADE | REMARKS |
|-----|-----------------|--------|------------------------------------|---------------------------------------|-------------------|--------------------|----------------------|------------|-------|---------|
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Signature of Examiner.....

Signature of ILO.....

Name of examiner.....

Name of ILO.....

ARUSHATECHNICAL COLLEGE

INDUSTRIAL PRACTICAL TRAINING ASSESSMENT REPORT

DEPARTMENT.....
 NTA LEVEL 7
 MODULE CODE.....

ACADEMIC YEAR.....
 DATE OF REPORTING.....

| NO | STUDENTS NAMES. | ADM NO | COLLEGE SUPERVISOR'S REPORT 05% | INDUSTRIAL SUPERVISOR'S REPORT 05% | ORAL PRESENTATION 25% | LOGBOOK | | | TOTAL 100% | GRADE | REMARKS |
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| | | | | | | DAILY SUMMARY 10% | WEEKLY SUMMARY 10% | TECHNICAL REPORT 45% | | | |
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Signature of Examiner.....

Signature of ILO.....

Name of examiner.....

Name of ILO.....

APPENDIX 6: ORAL PRESENTATION DISTRIBUTION MARKS

ARUSHATECHNICAL COLLEGE

A: NATIONAL TECHNICAL AWARDS LEVELS 4-5

| S/No. | ITEM | Factor | Max |
|-------|-----------------------------------|------------|------------|
| 1 | General appearance of the student | 1.0% | 100 |
| 2 | Clarity of presentation | 2.0% | 100 |
| 3 | Confidence in presentation | 1.5% | 100 |
| 4 | Flow/organization of presentation | 2.5% | 100 |
| 5 | Quality of contents presented | 5.0% | 100 |
| 6 | Ability in answering of questions | 3.0% | 100 |
| | Total marks | 15% | 100 |

B: NATIONAL TECHNICAL AWARDS LEVEL 7

| S/No. | ITEM | Factor | Max |
|-------|-----------------------------------|------------|------------|
| 1 | General appearance of the student | 3.0% | 100 |
| 2 | Clarity of presentation | 5.0 % | 100 |
| 3 | Confidence in presentation | 3.0 % | 100 |
| 4 | Flow/organization of presentation | 4.0% | 100 |
| 5 | Quality of contents presented | 5.0% | 100 |
| 6 | Ability in answering of questions | 5.0% | 100 |
| | Total marks | 25% | 100 |

APPENDIX 7: PROPOSED TRAINING COVERAGE FOR EACH PROGRAMME DURING IPT

7.4.1.1 AUTOMOTIVE ENGINEERING PROGRAMME

a) NTA LEVEL 4

- Identify Workshop Safety and Regulations
- Employ Common Workshop Tools, Instruments and Equipment
- Apply Testing Equipment/Instruments (CO tester, Multi-meter, Compression meter, Compression loss meter, Nozzle tester,)
- Workshop equipment - (Compressors, Jacks, Gas welding, Arc welding, Wheel balancing, Wheel alignment, Bench work
- Differentiate various auto Chassis and Chassis frame, Engine location
- Carry out measurements, repair and service related to – (Engine block, cylinder head, crankshaft, camshaft, pistons, connecting rods, valves, flywheel, gudgeon pins,)
- Examine serviceability of major liquid cooling components
- Carry out diagnosis, repair and service to components of cooling systems

b) NTA LEVEL 5

- **Carry out Diagnosis, Repair and Service of Major Components of Conventional Fuel Systems:**
- Differentiate conventional Ignition with computer controlled ignition
- Diagnose conventional and transistorized coil ignition faults.
- Employ various available methods to measure toe in/ toe out for modern cars steering systems.
- Diagnose and repair faults of conventional braking systems
- Diagnose and repair faults of ABS braking systems
- Identify various mechanisms of auto clutching systems
- Diagnose and repair faults from conventional manual gearboxes
- Service Automatic Transmission
- Identify various forms of final drives
- Carry out service and repairs of suspension systems
- Identify various methods used in Engine Management Systems
- Carry out maintenance and faults diagnosis for fuel systems
- Perform Diagnosis, Repair and Service on fuel injection system:

- Perform Diagnosis, Repair and Service air induction system:
- Perform auto lighting circuits and maintenance of the systems.
- Perform maintenance of auto auxiliary equipment.
- Differentiate various sensors and actuators.

c) NTA LEVEL 6

- Diagnose faults and repair of alternators
- Diagnose faults and repair of starter motors
- Diagnose faults and repair of ignition systems
- Carry out maintenance of starting battery.
- Carryout fast and slow battery charge.
- Carryout on-vehicle test of an auto starting system.
- Disassemble, Assemble and test Auto starter components
- Carry out on-vehicle test of charging systems.
- Disassemble, Assemble and test alternators components
- Carryout lighting system test and repair.
- Draw simple circuits of lightning system.
- Interpret auxiliary circuits
- Carryout of an ignition system test.
- Carryout ignition timing.
- Diagnose auto safety and comfort devices faults.

7.4.1.2 AUTO ELECTRIC AND ELECTRONICS ENGINEERING PROGRAMME

a) NTA LEVEL 4

- Identify Workshop Safety and Regulations
- Employ Common Workshop Tools, Instruments and Equipment
- Apply Testing Equipment/Instruments ((CO tester, Multi-meter, Compression meter, Compression loss meter, Nozzle tester,)
- Workshop equipment - (Compressors, Jacks, Gas welding, Arc welding, Wheel balancing, Wheel alignment, Bench work
- Differentiate various auto Chassis and Chassis frame, Engine location

- Carry out measurements, repair and service related to – (Engine block, cylinder head, crankshaft, camshaft, pistons, connecting rods, valves, flywheel, gudgeon pins,)
- Examine serviceability of major liquid cooling components
- Carry out diagnosis, repair and service to components of cooling systems

b) NTA LEVEL 5

- **Carry out Diagnosis, Repair and Service of Major Components of Conventional Fuel Systems:**

- Differentiate conventional Ignition with computer controlled ignition
- Diagnose conventional and transistorized coil ignition faults.
- Employ various available methods to measure toe in/ toe out for modern cars steering systems.
- Diagnose and repair faults of conventional braking systems
- Diagnose and repair faults of ABS braking systems
- Identify various mechanisms of auto clutching systems
- Diagnose and repair faults from conventional manual gearboxes
- Service Automatic Transmission
- Identify various forms of final drives
- Carry out service and repairs of suspension systems
- Identify various methods used in Engine Management Systems
- Carry out maintenance and faults diagnosis for fuel systems
- Perform Diagnosis, Repair and Service on fuel injection system:
- Perform Diagnosis, Repair and Service air induction system:
- Perform auto lighting circuits and maintenance of the systems.
- Perform maintenance of auto auxiliary equipment.
- Differentiate various sensors and actuators.

c) NTA LEVEL 6

- Repair auto safety devices (seat belts, head rests, speed controls, central locking system and antilock braking system (ABS) defects.
- Activate immobilizer.
- Repair auto comfort devices defects.

- Diagnose auto air conditioning, ventilation and heating devices faults.
- Explain guidelines which must be followed while servicing A/C system.
- Carry out routine maintenance of A/C control switches and sensors.
- Recharge A/C system with proper refrigerant.
- Diagnose auto radio faults.
- Diagnose auto security alarm faults.
- Diagnose auto GPS faults.
- Diagnose auto television faults.
- Repair auto radio defects.
- Repair auto security alarm defects.
- Repair auto GPS defects.
- Repair auto television defects.
- Perform cranking condition test.
- Perform Engine rotational resistance test.
- Perform misfire test.
- Confirm with the result of the Data Transfer Cable (DTC) or Vehicle Communication Interface (VCI) output.
- Perform emission control tests.
- Identify OBD connector (socket).
- Distinguish the difference between OBD-I and OBD-II sockets/connectors.
- Perform On board Diagnostics (OBD) system.
- Perform engine management diagnosis by using ECU (Malfunction indicator lamp).
- Interpret blink codes
- Perform engine management diagnosis by using scan tools

7.4.1.3 ELECTRONICS AND TELECOMMUNICATION ENGINEERING PROGRAMME

a) NTA Level 4

- Troubleshooting and installation of simple electrical and electronic systems: Lighting system, electric bells and alarms.

- Calibration of measuring equipment, such as; Multi-meters, Signal generators and Oscilloscopes.
- Rectifying electrical problems in office equipment such as; printers, photocopy machines and computers

b) NTA Level 5

- Troubleshooting simple electrical and electronic systems: Lighting system, electric bells, Security systems and alarms.
- Calibration of measuring equipment, such as; Multi-meters, Signal generators and Oscilloscopes.
- Design and implementation of simple and medium electronic systems such as; Text displays, Automatic switches and signaling devices
- Installation, troubleshooting and repair of telephone systems such as; Radio calls and Landline systems.
- Repair of inverters and incubators
- Rectifying electrical problems in office equipment such as; printers, photocopy machines and computers

c) NTA Level 6

- Troubleshooting simple electrical and electronic systems: Lighting system, electric bells, Security systems and alarms\
- Rectifying electrical problems in office equipment such as; printers, photocopy machines and computers
- Calibration of measuring equipment, such as; Multi-meters, Signal generators and Oscilloscopes.
- Design and implementation of simple and medium electronic systems such as; Text displays, Automatic switches and signaling devices
- Installation, troubleshooting and repair of telephone systems such as; Radio calls and Landline systems.
- Repair of inverters and incubators
- Troubleshooting and repair of communications systems such as; TV set, Satellite dish installation, Radar and Navigation systems
- Installation of computer software such as; antivirus and computer aided design tools

7.4.1.4 ELECTRICAL ENGINEERING PROGRAMME

a) NTA Level 4

- Design and Install & repair Lighting circuit
- Design and install Power circuit
- Repair electrical equipment

b) NTA Level 5

- Design and Install & repair Lighting circuit
- Design and install Power circuit
- Repair electrical equipment
- Design and Perform Industrial installation
- Rewinding transformer

c) NTA Level 6

- Design and Install & repair Lighting circuit
- Design and install Power circuit
- Repair electrical equipment
- Prepare maintenance schedule
- Rewinding Motor
- Repair electrical Machines
- Design and Repair digital and analogy systems
- Design and Perform Industrial installation

7.4.1.5 ELECTRICAL AND BIOMEDICAL ENGINEERING

a) NTA Level 4

- Design and Install & repair Lighting circuit
- Design and install Power circuit
- Repair electrical equipment

b) NTA Level 5

- Design and Install & repair Lighting circuit

- Design and install Power circuit
- Repair electrical equipment
- Design and Perform Industrial installation
- Rewinding transformer

c) NTA Level 6

- Diagnose and repair medical equipment faults, calibrate medical equipment of **medium** complexity
- Perform electrical repair in hospital
- Perform preventive maintenance
- Diagnose and rectify electrical faults on biomedical equipment
- Diagnose and rectify Bio-mechanical faults
- Perform mechanical measurements on Biomedical systems
- Perform Biomedical equipment calibration and testing according to the specifications
- Perform electrical calibration on biomedical measuring instruments
 - Apply testing and calibration equipment
 - Test and check medical equipment for accuracy
 - Perform actual calibration on medical equipment
 - Document test results and issue a calibration report
- Perform electrical measurements on biomedical equipment
 - Test biomedical equipment for earth leakage current
 - Test biomedical equipment for proper grounding
- Functional testing on biomedical equipment

7.4.1.6 CIVIL ENGINEERING PROGRAMME

a) NTA Level 4

- Carryout chain survey, compass survey and levelling for construction of buildings, roads, and other civil structures
- Construction of buildings, roads, and other civil structures

- Carryout, installation and maintenance of services (Plumbing fixtures, domestic electrical wiring, drainage, water supply) and welding of simple structures.
- Carryout materials laboratory testing (Soils, aggregates and concrete)
- Application of ICT skills in Construction industry

b) NTA Level 5

- Construction and maintenance of bituminous roads
- Construction and maintenance of buildings
- Installation and maintenance of services (air conditions, elevators, temporary supports, hot water systems, construct upper floors and roofs. Materials laboratory testing (Soils, aggregates and concrete)
- Land surveying (Theodolite and EDM survey and levelling)
- Design of cement concrete mixes
- Design of bituminous roads
- Design of reinforced concrete structures
- Application of ICT skills in Engineering Drawing
- Application of ICT skills in project planning and management

c) NTA Level 6

- Construction and maintenance of water supply and sanitation systems
- Construction and maintenance of buildings
- Design of cement and bituminous concrete mixes
- Design of steel structures
- Design of timber structures
- Design of reinforced concrete structures
- Application of ICT skills in civil engineering drawing
- Application of ICT skills in project planning and management

7.4.1.7 CIVIL & IRRIGATION ENGINEERING PROGRAMME

a) NTA Level 4

- Carryout chain survey, compass survey and leveling for construction of buildings, roads, and other civil structures
- Construction of buildings, roads, and other civil structures

- Carryout, installation and maintenance of services (Plumbing fixtures, domestic electrical wiring, drainage, water supply) and welding of simple structures.
- Carryout materials laboratory testing (Soils, aggregates and concrete)
- Application of ICT skills in Construction industry

b) NTA Level 5

- Construction and maintenance of bituminous roads
- Construction and maintenance of buildings
- Installation and maintenance of services (air conditions, elevators, temporary supports, hot water systems, construct upper floors and roofs. Materials laboratory testing (Soils, aggregates and concrete)
- Land surveying (Theodolite and EDM survey and levelling)
- Design of cement concrete mixes
- Design of bituminous roads
- Design of reinforced concrete structures
- Application of ICT skills in Engineering Drawing
- Application of ICT skills in project planning and management.

c) NTA Level 6

- Design of irrigation schedules
- Design of simple irrigation schemes
- Construction, operation, and maintenance of water supply and sanitation systems
- Construction, operation, and maintenance of irrigation structures
- Construction, operation and maintenance of irrigation schemes
- Computer aided drawings
- Application of ICT skills in civil and irrigation engineering
- Application of ICT skills in project planning and management

d) NTA Level 7: FIRST YEAR

- Construction and maintenance of water supply systems
- Construction and maintenance of irrigation structures
- Design of gravity flow irrigation systems
- Design of pressurized irrigation systems
- Design of diversion and impounding structures

- Design of reinforced concrete structures
- Application of ICT skills in civil and irrigation engineering drawings
- Application of ICT skills in project planning and management

e) NTA Level 7: SECOND YEAR

- Irrigation system performance evaluation
- Construction and maintenance of irrigation structures
- Design of gravity flow irrigation systems
- Design of pressurized irrigation systems
- Design of diversion and impounding structures
- Design of reinforced concrete structures
- Geographical information systems (GIS) for land resources
- Application of ICT skills in project planning and management

7.4.1.7.8 INFORMATION TECHNOLOGY PROGRAMME

a) NTA LEVEL 4

- Carry out different activities using Ms Office package
- Carry out different computer network activities such as terminating network cables and installation of Local Area Network
- Carry out different computer troubleshooting problem
- Carry out different computer maintenance activities for both computer software and hardware
- Installation of operating systems and application software's.

b) NTA LEVEL 5

- Carry out different computer network activities such as network cables termination, Designing Local Area Network, installation of Local Area Network, Configuration of a network and subnetting a network.
- Carry out troubleshooting problem for both computers, printers and faxes.
- Carry different computer maintenance activities for both computer hardware and software
- Carry out web designing activity (Designing a static website, updating content on the website)

c) NTA LEVEL 6

- Carry out different task of network Operation System
- Assist in carrying analysis on system requirement for the organization.
- Develop dynamic websites
- Carry out different computer network activities such as network cables termination, Designing Local Area Network, installation of Local Area Network, Configuration of a network and subnetting a network.
- Carry out troubleshooting problem for computers, printers and faxes.
- Carry different computer maintenance activities for both computer hardware and software
- Assist in budgeting activities for IT resources in the company.

7.4.1.9 COMPUTER SCIENCE PROGRAMME

a) NTA LEVEL 4

- Carry out different activities using Ms Office package
- Carry out different computer network activities such as terminating network cables and installation of Local Area Network
- Carry out different computer troubleshooting problem
- Carry out different computer maintenance activities for both computer software and hardware
- Installation of operating systems and application software's.

b) NTA LEVEL 5

- Carry out different computer network activities such as network cables termination, Designing Local Area Network, installation of Local Area Network, Configuration of a network and subnetting a network.
- Carry out troubleshooting problem for computers, printers and faxes.
- Carry different computer maintenance activities for both computer hardware and software
- Carry out web designing activity (Designing a static website, updating content on the website)

c) NTA LEVEL 6

- Carry out different task of system analysis and design.
- Develop dynamic websites

- Involved in software development such as content management system, database system etc.
- Carry out different computer network activities such as network cables termination, Designing Local Area Network, installation of Local Area Network, Configuration of a network and subnetting a network.
- Carry out troubleshooting problem for computers, printers and faxes.
 - Carry different computer maintenance activities for both computer hardware and software

7.4.1.10 MECHANICAL ENGINEERING PROGRAMME

a) NTA level 4

- Welding and Metal Fabrication (Arc and gas welding): Implementing simple repair and fabrication using various welding concepts and principles.
- Doing simple trouble-shooting and maintenance in motor vehicles.
- Machine shop activities (Turning, Milling, Shaping, Drilling, etc.): producing simple machine components for customers and machine repair
- Performing bench works (Fitting, cutting, bending etc.)
- Heat treatment and materials testing for steel

b) NTA level 5

- Doing simple trouble-shooting and maintenance in Hydraulics and Pneumatics systems.
- Performing various types of casting including sand and die casting.
- Performing various types of Press tool work including piercing, blanking, trimming, deep drawing, extrusion of metals and plastics material.
- Machine shop activities (Turning, Milling, Shaping, Drilling, etc): producing various machine components
- Welding and Metal Fabrication (Arc and gas welding): fabrication of various mechanical components using various welding techniques and principles.
- Site activities related to the above skills
- Machine maintenance and services activities

c) NTA level 6

- Applying knowledge and skills in estimating quantities and costs of materials and labour required for simple projects and experiments (BoQ and Costing).
- Troubleshooting, maintaining and repair of Air conditioning and refrigeration plants.
- Welding and Metal Fabrication: fabrication of various mechanical components using TIG, MIG and Spot welding.
- Using detail-working and assembly drawings for planning, maintenance and installations.
- Drawing of various machine parts with AutoCAD.
- Performing inspection and repair of machines and equipment
- Machine shop activities (Turning, Milling, Shaping, Drilling, etc): producing various machine components
- Doing trouble-shooting and maintenance in Hydraulics and Pneumatics systems.
- Using programmable logic controllers (PLC) for various automation and processing plants
- Machine maintenance and services activities
- Site activities related to the above skills
- Supervising Artisans and Craftsman
- Any other mechanical activity assigned by the supervisor

7.4.1.11 LABORATORY SCIENCE AND TECHNOLOGY PROGRAMME

For all levels (NTA LEVEL 4-6) depending on which placement

1. In gemstones

- gypsum and limestone analysis
- sample preparation
- fire assay (gold analysis)
- XRF analysis

2. Production of cement

- gypsum and limestone analysis
- XRF analysis
- titration

- sample preparation

3. research institution

- quality control of pesticides
- titrations
- physical test of pesticides
- preservation
- classification of organisms
- determination of major and trace elements

4. in hospitals

- hemoglobin test
- sickle cell screening and picturing
- full blood picture
- blood grouping
- blood cross matching
- blood donation
- hepatitis test
- blood transfusion
- microscopic examination of urine, stool and blood slides
- sperm counting
- erythrocytes sedimentation rate
- tuberculosis test
- culturing
- venous blood collection and puncture blood collection
- random blood glucose
- fast blood glucose
- MRDT
- HIV rapid test
- Pus collection
- CD4 count
- HVS

5. In science/engineering schools, college and universities

- Preparation of solution and standardization
- Preservation of specimens (wet and dry methods)
- Stock taking
- Food test sampling and preparation
- Sampling of specimens
- Dissection of mouse, cockroach, toad
- Preparation of teaching aids (Physics, chemistry and biology)

6. In Water Quality and Management Laboratories

- Analysis of Physiochemical and bacteriological parameters

7.4.1.12 TRANSPORTATION ENGINEERING DEPARTMENT

a) NTA Level 4

- Carryout chain survey, compass survey and levelling for construction of buildings, roads, and other civil structures
- Construction of buildings, roads, and other civil structures
- Carryout, installation and maintenance of services (Plumbing fixtures, domestic electrical wiring, drainage, water supply) and welding of simple structures.
- Carryout materials laboratory testing (Soils, aggregates and concrete)
- Application of ICT skills in Construction industry

b) NTA Level 5

- Construction and maintenance of bituminous roads
- Construction and maintenance of buildings
- Installation and maintenance of services (air conditions, elevators, temporary supports, hot water systems, construct upper floors and roofs. Materials laboratory testing (Soils, aggregates and concrete)
- Land surveying (Theodolite and EDM survey and levelling)

- Design of cement concrete mixes
- Design of bituminous roads
- Design of reinforced concrete structures
- Application of ICT skills in Engineering Drawing
- Application of ICT skills in project planning and management

b) NTA Level 6

- Construction and maintenance of Bituminous roads and concrete roads;
- Construction and maintenance of Airports;
- Construction and maintenance of Harbour docks;
- Construction and maintenance of Railways;
- Design of cement and bituminous concrete mixes Construction and maintenance of Airports;
- Design of Bituminous roads;
- Pavement materials;
- Design of Reinforced Concrete roads and structures;
- Application ICT skills in Transportation Engineering; and
- Application ICT skills in project planning and management.

7.4.1.13 LAPIDARY AND JEWELLARY TECHNOLOGY

- Cutting of the gemstone
 - Pre-shaping, faceting and polishing of the gemstone
- Engraving the rocks
 - Slicing, shaping in different shapes and polishing of the rock
- Jewelry designing
 - Designing a simple handy craft jewelry
 - Using different types of metals to make a simple jewelry
- Identification of Rocks
 - Identify the type of the rocks and their formation.
- Identification of the gemstones
 - Identify the type of gemstone using Physical characteristics

