



SATHYABAMA

**INSTITUTE OF SCIENCE AND TECHNOLOGY
(DEEMED TO BE UNIVERSITY)**

INTERNSHIP REVIEW

(JANUARY 2022– JANUARY 2022)

INTERNSHIP COMPLETED AT

INTERMED,

4,G.K.INDUSTRIAL ESTATE, ARCOT ROAD, PORUR

CHENNAI-600116

SUBMITTED BY

A.MAHALAKSHMI

40910005

MASTER OF SCIENCE IN CHEMISTRY

SATHYABAMA INSTITUTE OF SCIENCE AND TECHNOLOGY,

CHENNAI-600119

1. INTERNSHIP CERTIFICATE:-



interMed

(Government Recognized Export House)

FACTORY : # 4, G.K. INDUSTRIAL ESTATE, ARCOT ROAD, PORUR, CHENNAI - 600 116.

TEL : 91-044-2386 0360 / 2476 6460 FAX : 91-044-42180932

E-mail : adminchennai@intermedindia.com

29-01-2021,
Chennai.

To Whomsoever It May Concern

This is to certified that A.Mahalakshmi(M.Sc Chemistry) Final Year Student of **SATHYABAMA UNIVERSITY, Chennai**, has successfully completed her Internship Training in the different departments like FR&D, QC, QA, Solid orals Production, Liquid Oral Production, Topical products and Packing in our company from 17.01.2021 to 29.01.2021.

During the period of her Internship Training with us she had been exposed to different process was found punctual, Hard Working and Inquisitive.

We wish her every success in her Life and Career.

Dr.K.Balaji,

**FR&D Head,
Intermed.**

2. NPTEL CERTIFICATE:-

This certificate is computer generated and can be verified by scanning the QR code given below. This will display the certificate from the NPTEL repository, <https://nptel.ac.in/noc/>

Roll No: NPTEL21AG02S23341803

To
MAHALAKSHMI A
NO:290/4, V.O.C STREET, KOLAPAKKAM
KOLAPAKKAM, VANDALUR- CHENGALPATTU
CHENGALPATTU
TAMIL NADU - 600127
PH. NO :8072285135



No. of credits recommended by NPTEL:3

An additional 1 credit may be awarded if the University deems it fit, based on the actual student effort involved.

Score	Type of Certificate
>=90	Elite+Gold
75-89	Elite+Silver
>=60	Elite
40-59	Successfully Completed
<40	No Certificate



NPTEL Online Certification

(Funded by the Ministry of HRD, Govt. of India)



This certificate is awarded to
MAHALAKSHMI A
for successfully completing the course

Dairy and Food Process and Products Technology

with a consolidated score of **52** %

Online Assignments	20.31/25	Proctored Exam	31.5/75
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Total number of candidates certified in this course: **653**


Prof. G P Raja Sekhar
Dean, Continuing Education
IIT Kharagpur

Jul-Oct 2021
(12 week course)


Prof. Debjani Chakraborty
Coordinator, NPTEL
IIT Kharagpur



Indian Institute of Technology Kharagpur



Roll No:NPTEL21AG02S23341803

To validate and check scores: <https://nptel.ac.in/noc>

INTERNSHIP REPORT:

ABOUT THE COMPANY:-



INTERMED in PORUR, chennai known as satisfactory cater to the demands of the customer base. The business came to an existence in 2003 and has, since then I, a known name in its field. It stands located at No 4 G K Industrial estate ARCOT road PORUR-600116. It's has earned stamps like JD verified, JD Escrow, JD Trusted Substantiating the credentials of the business. The business strive to positive experience through its offerings.

This business has a wide range of product offering and the product/ catalogue list includes pharmaceutical, pharmaceutical product, tablet, rugged tablet pc etc.....

We have been gradually upgrading our factory by investing back the profits earned and we are a WHO-GMP approved with facilities to manufacture Tablets, Capsules, Syrups, Dry Syrups and Ointments and creams.

WHAT WE DID:-

On first day we were get to know about the industry and staffs. How they handle the instruments and what is the purpose of it and how they produce the tablets, syrup, Ointments, capsule and transdermal patches. And then we know about how they fix the expiry date for the tablets and we studied the Sop's how the industry should work. we just got the chance to see how they handle the machines, we can't Abel to Handel any instruments.

1. SOP'S STUDIED :-

DOCUMENTATION PRACTICES AND MANAGEMENT:

- 1.Purpose and scope of documentation practices and management.
- 2.Genral GMP document creation and maintenance requirement.
- 3.Use of GMP documents.
- 4.management of procedure printed as controlled copies.
- 5.Enter to GMP documents.
- 6.use of N/AS for blank field and section.
- 7.Requirements for sign and dates.

2. Products they produce:-

❖ Tablets:-

- Paracetamol.
- Nifedipine.

❖ Capsules:-

- Fluconazole.

❖ Ointments:-

- B beauty cream.
- Chlotrimazole.

❖ Syrup:-

- Cofix.

❖ Transdermal patches:-

- menthol(painkiller) 5%
- Lidocaine 4% pain relieving patch (shoulder, neck, back pain)

3. INSTRUMENTS SEEN:-

- High Performance Liquid Chromatography
- Ultra Violet Visible Spectroscopy
- Gas Chromatography
- Centrifuge Machine
- Tablet hardness tester
- Hot Air Oven
- Vacuum Oven
- pH Meter

5.1 FOURIER TRANSFORM INFRARED SPECTROSCOPY (FTIR):

PRINCIPLE:

FTIR is most useful for identifying chemicals that are either organic or inorganic. It can be utilized to quantitate some components of an unknown mixture and for the analysis of solids, liquids, and gases. The term Fourier Transform Infrared Spectroscopy (FTIR) refers to a development in the manner in which the data is collected and converted from an interference pattern to a spectrum. It is a powerful

tool for identifying types of chemical bonds in a molecule by producing an infrared absorption spectrum that is like a molecular “fingerprint”. The wavelength of light absorbed is characteristic of the chemical bond as can be seen in this annotated spectrum.

SUMMARY

The FTIR instrument sends infrared radiation of about 10,000 to 100 cm^{-1} through a sample, with some radiation absorbed and some passed through. The absorbed radiation is converted into rotational and/or vibrational energy by the sample molecules. The resulting signal at the detector presents as a spectrum, typically from 4000 cm^{-1} to 400 cm^{-1} , representing a molecular fingerprint of the sample. Each molecule or chemical structure will produce a unique spectral fingerprint, making FTIR analysis a great tool for chemical identification.

FTIR spectroscopy is an established technique for quality control when evaluating industrially manufactured material, and can often serve as the first step in the material analysis process. A change in the characteristic pattern of absorption bands clearly indicates a change in the composition of the material or the presence of contamination. If problems with the product are identified by visual inspection, the origin is typically determined by FTIR microanalysis. This technique is useful for analyzing the chemical composition of smaller particles, typically 10 -50 microns, as well as larger areas on the surface.



5.2 Performance Liquid Chromatography :-

High Performance Liquid Chromatography (HPLC) is a form of column chromatography that pumps a sample mixture or analyte in a solvent (known as the mobile phase) at high pressure through a column with chromatographic packing material (stationary phase). The sample is carried by a moving carrier gas stream of helium or nitrogen. HPLC has the ability to separate, and identify compounds that are present in any sample that can be dissolved in a liquid in trace concentrations as low as parts per trillion. Because of this versatility, HPLC is used in a variety of industrial and scientific applications, such as pharmaceutical, environmental, forensics, and chemicals.

Sample retention time will vary depending on the interaction between the stationary phase, the molecules being analysed, and the solvent, or solvents used. As the sample passes through the column it interacts between the two phases at different rate, primarily due to different polarities in the analysts.

Analysts that have the least amount of interaction with the stationary phase or the most amount of interaction with the mobile phase will exit the column faster.



(High Performance Liquid Chromatography)

5.3 Ultra Violet Visible Spectroscopy:-

Ultraviolet–visible spectroscopy or ultraviolet–visible spectrophotometry (UV–Vis or UV/Vis) refers to absorption Spectroscopy or reflectance spectroscopy in part of the ultraviolet and the full, adjacent visible spectral regions. This means it uses light in the visible and adjacent ranges. The absorption or reflectance in the visible range directly affects the perceived colour of the chemicals involved. In this region of the electromagnetic spectrum, atoms and molecules undergo electronic transitions.



(ULTRA VIOLET VISIBLE SPECTROSCOPY)

5.4 Gas Chromatography:-

Chromatography used in analytical chemistry for separating and analyzing compounds that can be vaporized without decomposition. Typical uses of GC include testing the purity of a particular substance,

or separating the different components of a mixture.[1] In preparative chromatography, GC can be used to prepare pure compounds from a mixture.



(E) (GAS CHROMATOGRAPHY)

5.5 Centrifuge Machine:-

A centrifuge is a device that uses centrifugal force to separate various components of a fluid. This is achieved by spinning the fluid at high speed within a container, thereby separating fluids of different densities (e.g. cream from milk) or liquids from solids. It works by causing denser substances and particles to move outward in the radial direction. At the same time, objects that are less dense than the fluid, while low-density substances rise to the top. A centrifuge can be a very effective filter that separates contaminants from the main body of fluid. Bottom of the tube, while low-density substances rise to the top.[1] A centrifuge can be a very effective filter that separates contaminants from the main body of fluid.



5.6 Tablet hardness tester:-

Tablet hardness testing, is a laboratory technique used by the pharmaceutical industry to determine the breaking point and structural integrity of a tablet and find out how it changes “under conditions of storage, transportation, packaging and handling before usage The breaking point of a tablet is based on its shape. It is similar to friability testing, but they are not the same thing.

Tablet hardness testers first appeared in the 1930s. In the 1950s, the Strong-Cobb tester was introduced. It was patented by Robert Albrecht on July 21, 1953. and used an air pump. The tablet breaking force was based on arbitrary units referred to as Strong-Cobbs. The new one gave readings that were inconsistent to those given by the older testers. Later, electro-mechanical testing machines were introduced. They often include mechanisms like motor drives, and the ability to send measurements to a computer or printer.

There are 2 main processes to test tablet hardness: compression testing and 3 point bend testing. For compression testing, the analyst generally aligns the tablet in a repeatable way, and the tablet is squeezed between a fixed and a moving jaw. The first machines continually applied force with a spring and screw thread until the tablet started to break. When the tablet fractured, the hardness was read with a sliding scale.



(TABLET HARDNESS TESTER)

5.7 pH Meter:-

A pH meter is an instrument used to measure acidity or alkalinity of a solution – also known as PH.

PH is the unit of measure that describes the degree of acidity or alkalinity. It is measured on a scale of 0 to 14. The quantitative information provided by the pH measurement expresses the degree of the activity of an acid or base in terms of hydrogen ion activity. The pH value of a substance is directly related to the ratio of the hydrogen ion $[H^+]$ and the hydroxyl ion $[OH^-]$ concentrations. If the H^+ concentration is greater than OH^- , the material is acidic; i.e., the pH measurement is less than 7. If the OH^- concentration is greater than H^+ , the material is basic, with a pH value greater than 7. If equal amounts of H^+ and OH^- ions are present, the material is neutral, with a pH of 7. Acids and bases have free hydrogen and hydroxyl ions, respectively.

The relationship between hydrogen ions and hydroxyl ions in a given solution is constant for a given set of conditions, either one can be determined by knowing the other.



(pH METER)

4. Real time exposure in laboratory:

Stability studies- Testing Laboratory:-

Scope: The process performed in the Stability laboratory including instrumentation

Objective: To enhance my knowledge about stability laboratory.

The purpose of this stability test is to fix the expiry date for the drugs; they will fix the expiry date based on stability check in three conditions

Long term conditions

Accelerated stability conditions

Intermediate stability conditions

If the drug passes the accelerated stability conditions tests, then we can make a commitment with regulatory bodies and sell our products with a deal of submitting long term stability conditions tests within 36 months

Here the parenteral are kept in different chambers and each chamber will maintained at different conditions and this process is used to fix the expiry date at each condition

Based on the temperature and humidity the world is divided into 4 zones

Climatic Zone		Temperatures	Humidity
Zone I	Temperate	21 °C (± 2 °C)	45% RH (± 5%)
Zone II	Subtropical, with possible high humidity	25 °C (± 2 °C)	60% RH (± 5%)
Zone III	Hot/Dry	30 °C (± 2 °C)	35% RH (± 5%)
Zone IV	Hot/Humid	30 °C (± 2 °C)	65% RH (± 5%)
Zone IVb	Hot/Humid*	40° C (± 2 °C)	75% RH (± 5%)
Refrigerated		5 °C (± 3 °C)	None
Frozen		-15 °C (± 5 °C)	None

5. DEPARTMENTS:-

The main process of the department are:-

- ❖ Store
- ❖ QC (quality control)
- ❖ QA (quality assurance)

- ❖ Production
- ❖ Packing

STORE PROCESS:-

Steps involved in raw material ware house:-

- ❖ Receiving
- ❖ Sampling
- ❖ Quarantine
- ❖ Storing
- ❖ Dispensing

RECEIVING OF RAW MATERIAL:-

- Raw material is supplied by vendors by placing order.
- After receiving the raw materials check the “observation on pack”.
- Segregate the raw material according to batch number.
- Pre entry cleaning of raw materials by vacuum cleaner.
- Weighing of the raw materials.

SAMPLING OF RAW MATERIAL:-

- Before sampling get line clearance by QA person
- QC person test the sample of raw material under lab by different tests and fill it in “OBSERVATION ON SAMPLING AREA & PACK” and “CERTIFICATE OF ANALYSIS”
- Will paste the labels of “APPROVED LABEL” and “SAMPLED LABEL”
- Next the raw materials are sent for storing.

STORING OF RAW MATERIALS:

The raw material is stored in approved area at three different temperature.

AMBIENT: not more than 35c.

CONTROLLED TEMPERATURE ROOM: Nearly 15 to 25c.

COLD ROOM: between 2 to 8c.

DISPENSING OF RAW MATERIAL:-

Raw materials is dispensed from dispensing booth under lab of the production area.

In case of dispensing there is special provision for dispense the material.

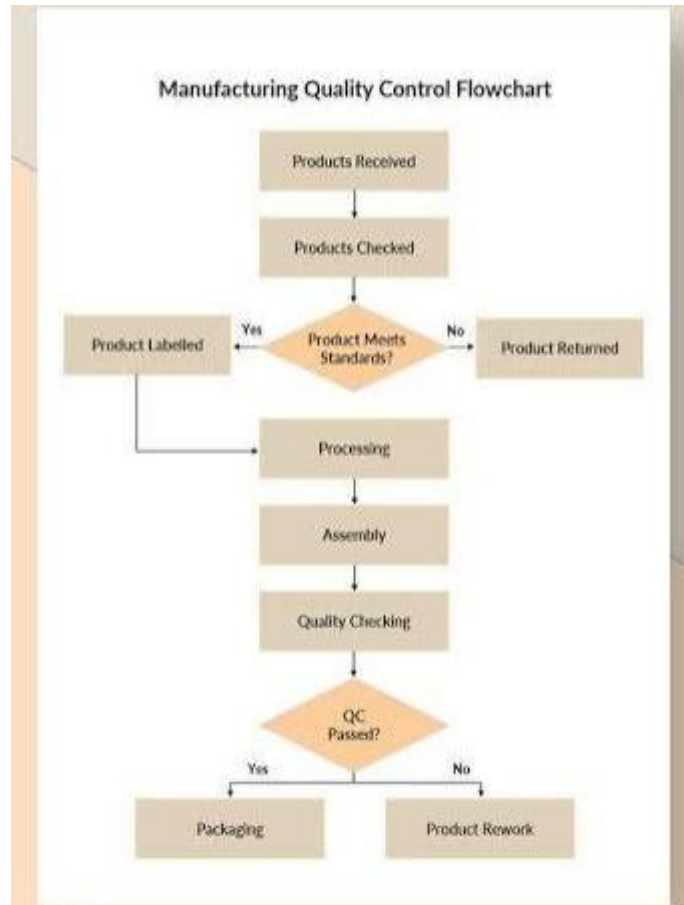
6. QUALITY CONTROL:-

Primary concern of the company is the provision of quality product and services to gain the trust of our clients.

We have implemented a quality and safety management system that complies with WHO-GMP regulations and requirements.

We are also continuously improving our process, products and quality and safety management system through team work with our staff, customers and suppliers.

Our Quality focus encompasses all areas of manufacturing operations-from the procurement of raw materials, to best possible manufacturing technology, functional operations to the delivery of finished formulations. Vendor assessment and assortment is carried out as per stringent quality, product, manufacturing and service and delivery parameters to ensure the highest quality inputs.



7. QUALITY ASSURANCE:-

The quality assurance department is managed by qualified personal, who constantly examines quality considerations-performing systematic sampling and testing at every stage from raw material through each procedure of intermediate and finished pharmaceutical formulations.

A regular valuation process, test methods, water and environment as well as periodic calibration of all instruments are carried out to ensure quality output of finished products.

8. QUALITY CONTROL LABORATORY:-

These norms are controlled by a superior high tech quality control laboratory and all activities are managed through four sections.

- Instrumental Analysis Laboratory.
- Wet Analysis Laboratory.
- Microbiological Testing laboratory.
- Packing material testing laboratory.

11. PACKING:-

- Pharmaceutical packaging (or drug packaging) is the packages and the packaging processes for pharmaceutical preparations. It involves all of the operations from production through drug distribution channels to the end consumer. ... Packaging is often involved in dispensing, dosing, and use of the pharmaceutical product..

❖ TYPES OF PACKING:-

- Primary packing.
- Secondary packing.
- Tertiary packing.

❖ PRIMARY PACKING:-

- Primary packaging means any single part of a container closure system. Typically containers (e.g. ampoules, vials, bottles).

❖ **SECONDARY PACKING:-**

- Secondary packaging is the exterior packaging of the primary packaging that groups packages and further protects or labels the drug product.

❖ **TERTIARY PACKING:-**

- Tertiary packaging is used for bulk handling, storage, and distribution.

➤ **SUMMARY AND CONCLUSION:-**

I can honestly say that my time spent during Internship at Intermed resuted as one of the best parts of my life. Through this training I have learnt a lot about quality assurance and analysing drug products. Not only I gain practical skills, but I had a lot of experience beyond my subject matter too. Thank you so much for all letting us your time instead of busy schedule every day for intellectual suggestions. This internship helps me a lot in my practical skills.

➤ **REFERENCE:-**

<https://www.pharmaguideline.com/2010/12/different-climatic-zones-for-stability.html?m=1>

<https://www.intermedindia.com/qualitycontrol.html>

[https://en.m.wikipedia.org/wiki/Drug_packaging#:~:text=Pharmaceutical%20packaging%20\(or%20drug%20packaging,channels%20to%20the%20end%20consumer.&text=Packaging%20is%20often%20involved%20in,use%20of%20the%20pharmaceutical%20product.](https://en.m.wikipedia.org/wiki/Drug_packaging#:~:text=Pharmaceutical%20packaging%20(or%20drug%20packaging,channels%20to%20the%20end%20consumer.&text=Packaging%20is%20often%20involved%20in,use%20of%20the%20pharmaceutical%20product.)

THANK YOU