


## **1.3 Curriculum Enrichment**

### **1.3.1 Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability into the Curriculum**

  
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### ***1.3.1: Institution integrates crosscutting issues relevant to Professional Ethics, Gender, Human Values, Environment and Sustainability in transacting the Curriculum***

According to the Institution, education should assist each student discover their individuality, comprehend their life's purpose, and contribute back to society, the environment, and other people. The capacity of schools to provide a diverse curriculum in order to assist children develops an inherent respect for life and a strong desire to study is the core of holistic education. Under the autonomous framework, the institution would analyse the significance of the world's most pressing concerns and crises, such as the environment, climate change, politics, socioeconomic inequality, and gender conflicts.

In order to address the problem of shared accountability, the Institution teaches students for them and society, educates them for a broader view of life, and instills a sense of social responsibility via these techniques.

Courses that are relevant in several areas and boost the educational process.

It has built a range of course types in order to include courses that are essential to gender, the environment and sustainability, human values, and professional ethics. The courses are designed to help students thrive and grow professionally while also teaching broad competencies such as gender, human values, professional ethics, environmental sustainability, and other themes. Field work, citizen participation, and gender sensitization are examples of practical activities connected to gender sensitivity that assist students understand challenges and conditions from real life. These courses put to the test students' conceptual, theoretical, and analytical understanding of gender as a social construction, as well as their knowledge of different methods to reaching gender parity in India and other countries.

The Institute instructs students on how to develop their moral character and job ethics. In order to demonstrate respect for the Institute and its students, ten golden principles for professional ethics in the workplace have been investigated in this context.



The following are the unbreakable laws:

1. Always strive towards excellence.
2. Be dependable.
3. Be Dependable
4. Always treat people with decency and respect.
5. Be dependable.
6. Quick and efficient.
7. Always behave ethically.
8. Always be real and admirable in all you do.
9. Respect the privacy of others.
10. Be role models for others

Students participate in a number of activities to professionally develop these concepts. The Women Empowerment Cell, Anti-Ragging Committee, NSS/NCC, Community Club, Environment Club, and other organizations and groups carry out a variety of activities. The efficient running of these committees and clubs is critical.


There are mandatory courses in UG courses such as environmental sciences, soft skills and professional ethics, gender sensitization, the Indian Constitution, and the essence of Indian traditional knowledge; and courses in PG courses such as value education, stress management through yoga, personality development through life enlightenment skills, and other courses. Seminars, workshops, guest lectures, and industry visits are used to emphasise the importance of the course to students about environmental concerns.



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**LIST OF ACTIVITIES ORGANISED BY THE COLLEGE TO ADDRESS VARIOUS CROSS CUTTING ISSUES DURING THE LAST FIVE YEARS(2021-2022, 2020-21, 2019-20, 2018-19 & 2017-18)**

S.NO	NAME OF THE ACTIVITY	CROSS CUTTING ISSUES INTEGRATED
1	Rangoli	Environment and sustainability
2	Haritha Haram	Environment and sustainability
3	National Pollution Day	Environment and sustainability
4	Ganesh Chaturthi	Environment and sustainability
5	Swaccha Bharath	Environment and sustainability
6	Bathukamma Festival	Environment and sustainability
7	World Water Day	Environment and sustainability
8	Yoga Day	Gender Equity
9	Women Safety Awareness Program	Gender Equity
10	National Youth Day	Gender Equity
11	National Girl Child Day	Gender Equity
12	Rastriya Ektha Diwas	Gender Equity
13	Signature Day	Gender Equity
14	Sports Meet	Gender Equity
15	Teacher's Day	Human Values and Professional Ethics
16	International Women's Day	Human Values and Professional Ethics
17	World's Pharmacist Day	Human Values and Professional Ethics
18	Traditional Day	Human Values and Professional Ethics
19	Bathukamma Festival	Human Values and Professional Ethics
20	National Farmers Day	Human Values and Professional Ethics
21	National Voters Day	Human Values and Professional Ethics

  
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**08.01.2021**

It is hereby informed to all the staff and students that to participate in 'Awareness on Natural Colours (Rangoli)' on 11.01.2021 organized by NSS Unit, Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist. In this regard you are informed to participate in this program and make it success.



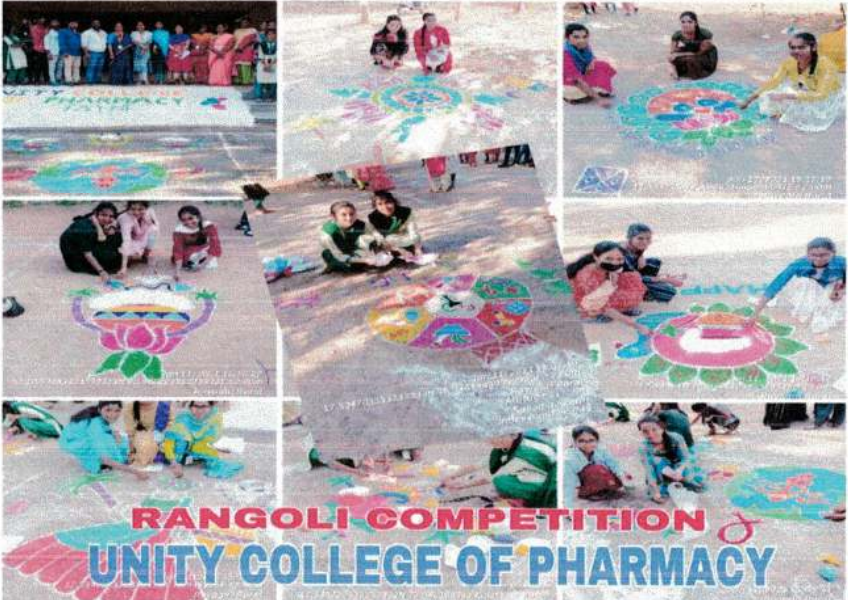
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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Natural Colors Awareness Program (Rangoli)</b>	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	<b>11.01.2021</b>	<b>03.00 pm</b>
<b>Details of Particulars</b>	<b>100</b>	
<b>Coordinator</b>	<b>Immadi Rajeev</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	<p>The main goal of the Program is focused on Awareness on Natural Colors organized by <b>NSS Unit of Unity College of Pharmacy</b> . In this Program Hon'ble Chairman of Unity Colleges <b>Mr. A.Prabhakar Reddy</b> garu has Participated; Principal of the College, Vice-Principal, all the faculty members and 100 students participated in this awareness program. Program was inaugurated by Chairman A.Prabhakar Reddy garu and Program officer <b>Mr.Immadi Rajeev</b> . The prizes were distributed to all the winners.</p>	
<b>Photos</b>		

  
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**01.07.2020**

It is hereby informed to all the staff and students that to participate in '**Haritha Haram (Plantation)**' on 01.07.2020 organized by NSS Unit, Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Haritha Haram</b>	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	<b>07.07.2020</b>	<b>03.00 pm</b>
<b>Details of Particulars</b>	<b>60 students</b>	
<b>Coordinator</b>	<b>Md.Ismail</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	NSS Unit of Unity College of Pharmacy has organized Haritha Haram (Plantation) in response to the slogan given by the State Govt., Telangana State.	
<b>Photos</b>		

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**11.01.2020**

It is hereby informed to all the staff and students that to participate in 'National Youth Day' on 12.01.2021 organized by NSS Unit, Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	YUVA DIWAS	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	12.01.2021	11.00am
<b>Details of Particulars</b>	180 students participated	
<b>Coordinator</b>	Md.Ismail	
<b>Organizing Dept./Support system</b>	NSS Unit	
<b>Description</b>	On the Occasion of National Youth Day, NSS Unit of Unity College of Pharmacy has organized Yuva Diwas on 12.01.2021. The purpose of this program was to introduce Swami Vivekananda, understand the importance of National Youth Day and Gender Equity.	
<b>Photos</b>		

  
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**22.01.2021**

It is hereby informed to all the staff and students that to participate in '**National Girl Child Day**' on 24.01.2021 organized by NSS Unit, Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist. In this regard you are informed to participate in this program and make it success.





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### ACTIVITY REPORT

<b>Name of the Activity</b>	<b>National Girl Child Day 2021</b>	
<b>Type of the Activity</b>	<b>Gender Equity</b>	
<b>Date and time of the Activity</b>	<b>24.01.2021</b>	<b>11.00am</b>
<b>Details of Particulars</b>	<b>200 students participated</b>	
<b>Coordinator</b>	<b>Mrs.V.Anitha</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Social Awareness Scheme, Unity College of Pharmacy has conducted National Girl Child Day, 2021. The program mainly aims the awareness about girl child rights and education. All the students and Faculty members participated in this program	
<b>Photos</b>	 <p>Shot on OnePlus By scs@yadri</p> <p>8/30/21 2:43:14</p>	

  
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**30.11.2019**

It is hereby informed to all the staff and students that to participate in 'National Pollution Day' on 02.12.2019 organized by NSS Unit, Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>National Pollution Day 2019</b>	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	<b>02.12.2019</b>	<b>10.00am – 12.00pm</b>
<b>Details of Particulars</b>	<b>200 students participated</b>	
<b>Coordinator</b>	<b>Mrs.V.Anitha</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	<p>The NSS Volunteers and Students of Unity College of Pharmacy has participated in the National Pollution Day , which mainly aimed on preventing pollution and creating awareness . This Day is observed on 2<sup>nd</sup> December of Every year in the memory of people who passed way due to Bhopal incident in 1984.</p>	
<b>Photos</b>		



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**02.09.2019**

It is hereby informed to all the staff and students that to participate in '**Ganesh Chathruthi**' on 03.09.2019 and **free Distribution of Clay Ganesh at Raigir**, organized by NSS Unit, Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Echo Friendly Ganesh</b>	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	<b>03.09.2019</b>	<b>1.00pm</b>
<b>Details of Particulars</b>	<b>150 students participated</b>	
<b>Coordinator</b>	<b>Mr.M.Ravi</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	<p>NSS Unit of Unity College of Pharmacy has organized Echo Fiendly Ganesh Idol festival on 3<sup>rd</sup> September, 2019. The main motto of this event is to demonstrate how the Clay Ganesh idol is echo-friendly.</p> <p>NSS Volunteers distributed clay Ganeshas and explained the harmness of POP Ganesh and uses of clay Ganesh at Ragiri village.</p>	
<b>Photos</b>		



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**16.10.2021**

It is hereby informed to all the staff and students that to participate in 'Swaccha Bharath Campaign' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 19.10.2021. In this regard you are informed to participate in this program and make it success.




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**ACTIVITY REPORT**

<b>Name of the Activity</b>	<b>Swatchh Bharat, Clean India Campaign 2.0</b>	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	<b>19.10.2021</b>	<b>10.58am</b>
<b>Details of Particulars</b>	<b>30 NSS Volunteers participated</b>	
<b>Coordinator</b>	<b>Immadi Rajeev</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Swatchh Bharat Clean India Campaign was organized by NSS Unit Volunteers of Unity College of Pharmacy. As a part of this program NSS volunteers of Unity College of Pharmacy conducted Clean India at Bhongir Railway station and Bank area. In this Program 30 NSS volunteers have participated	
<b>Photos</b>		

*Immadi Rajeev*

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**20.03.2021**

It is hereby informed to all the staff and students that to participate in 'World Water Day' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 21.03.2021. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>World Water Day 2021</b>	
<b>Type of the Activity</b>	Environment and sustainability	
<b>Date and time of the Activity</b>	<b>21.03.2021</b>	<b>11.00am</b>
<b>Details of Particulars</b>	<b>200 students participated</b>	
<b>Coordinator</b>	<b>Mrs.V.Anitha</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Social Awareness Scheme, Unity College of Pharmacy has conducted World Water Day 2021. All the students and Faculty members participated in this program	
<b>Photos</b>		

  
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**07.09.2020**

It is hereby informed to all the female staff and students that to participate in 'Women Rights Awareness' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 06.09.2020 through online. In this regard you are informed to participate in this program and make it success.



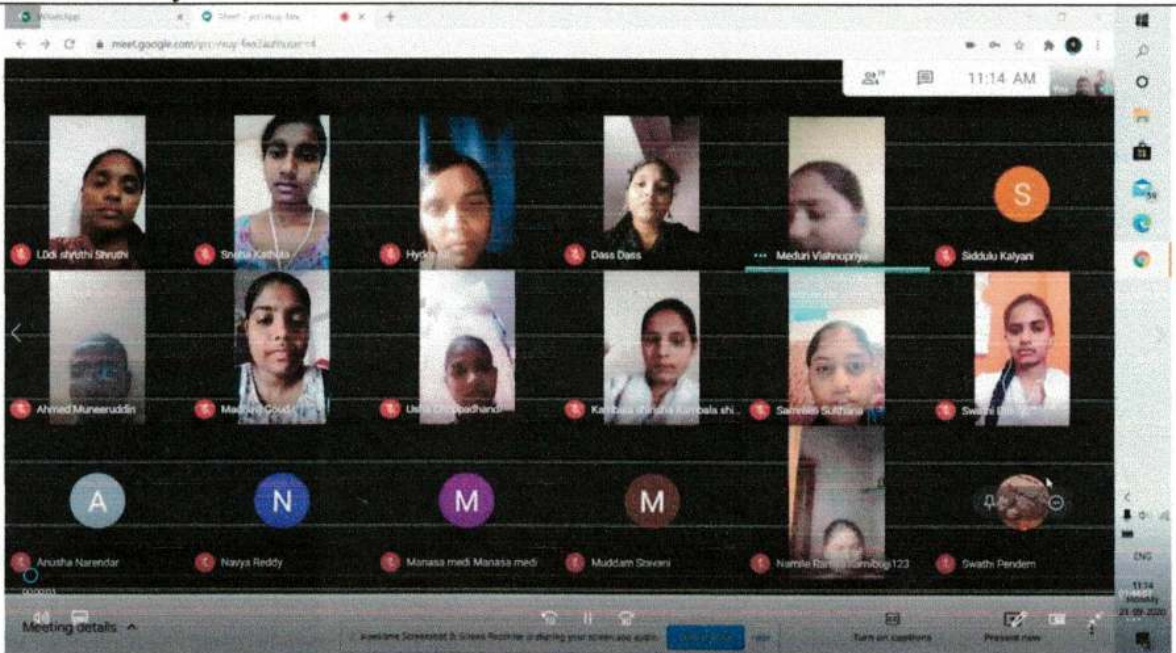
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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Women Rights Awareness</b>	
<b>Type of the Activity</b>	<b>Gender Equity</b>	
<b>Date and time of the Activity</b>	<b>06.09.2020</b>	<b>11.00am</b>
<b>Details of Particulars</b>	<b>80 students participated</b>	
<b>Coordinator</b>	<b>Md.Ismail</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	NSS Unit of Unity College of Pharmacy has organized Women Safety Awareness webinar in Association with Commissioner, Rachakonda Police. It mainly aims on women safety and influence of She teams.	
<b>Photos</b>		

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**18.06.2019**

It is hereby informed to all the staff and students that to participate in 'National Yoga Day' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 21.06.2019. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>National Yoga Day</b>	
<b>Type of the Activity</b>	<b>Gender Equity</b>	
<b>Date and time of the Activity</b>	<b>21.06.2019</b>	<b>9.00am</b>
<b>Details of Particulars</b>	<b>100 students participated</b>	
<b>Coordinator</b>	<b>Mr.S.Raghuraman</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of National Yoga Day, 21 <sup>st</sup> June 2019, Unity College of Pharmacy has organized National Yoga Day. In this Program 100 students and Faculty members were participated. As a part of this the Principal Dr.Ampati Srinivas has explained the importance of Yoga.	
<b>Photos</b>		



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**28.10.2022**

It is hereby informed to all the staff and students that to participate in 'National Yoga Day' organized by NSS Unit , Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 21.06.2019. In this regard you are informed to participate in this program and make it success.





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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Rastriya Ektha Diwas</b>	
<b>Type of the Activity</b>	<b>Gender Equity</b>	
<b>Date and time of the Activity</b>	<b>31.10.2022</b>	<b>10.41am</b>
<b>Details of Particulars</b>	<b>100 NSS Volunteers participated</b>	
<b>Coordinator</b>	<b>Immadi Rajeev</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	<p>The main goal of the Program is focused on Organizing Rastriya Ektha Diwas ( National Unity Day) to Commemorate the birth anniversary of <b>Sardar Vallabhbhai Patel</b> the architect national integration of independent India. As a part of Rastriya Ektha Diwas (National Unity Day) <b>NSS Unit of Unity College of Pharmacy</b> organized Unity 2K Run at Yadagirigutta. In this Program Hon'ble Chairman of Unity Colleges <b>Mr. A.Prabhakar Reddy</b> garu has Participated, Principal of the College, Vice-Principal, all the faculty members and 100 volunteers participated in this Unity 2K run. Program was inaugurated by Chairman A.Prabhakar Reddy garu by waving the Falg to start the 2k Unity Run. Program officer <b>Mr.Immadi Rajeev</b> has taken the following Rashtriya Ekta Diwas Pledge with all the NSS Volunteers and Faculty members of the Unity College of Pharmacy.</p>	
<b>Photos</b>	 	



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**01.08.2021**

It is hereby informed to all the staff and students that to participate in 'Signature Day' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 04.08.2021. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	Signature Day 2021	
<b>Type of the Activity</b>	Gender Equity	
<b>Date and time of the Activity</b>	04.08.2021	11.00am
<b>Details of Particulars</b>	200 students participated	
<b>Coordinator</b>	Dr.G.Prasad	
<b>Organizing Dept./Support system</b>	NSS Unit	
<b>Description</b>	As a Part of Social Awareness Scheme, as a token of love, Unity College of Pharmacy has conducted Signature Day 2021 for B.Pharmacy IV Year Students	
<b>Photos</b>		

  
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**25.11.2021**

It is hereby informed to all the staff and students that to participate in 'Sports Meet 2021' organized by NSS Unit, Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 28.11.2021 – 30.11.2021. In this regard you are informed to participate in this program and make it success.




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<b>Name of the Activity</b>	<b>Sports Meet 2021</b>	
<b>Type of the Activity</b>	<b>Gender Equity</b>	
<b>Date and time of the Activity</b>	<b>28.11.2021</b>	<b>11.00am</b>
<b>Details of Particulars</b>	<b>200 students participated</b>	
<b>Coordinator</b>	<b>Dr.G.Prasad</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	Sports Meet-2021 has conducted by Unity College of Pharmacy. All the college girls and boys have participated. As a part of this Meet, various Out Door sports like Cricket, Volley Ball, Kabaddi, Shuttles, Tennicoit etc., and Caroms, Chess like in door games were conducted.	
<b>Photos</b>		

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**04.09.2018**

It is hereby informed to all the staff and students that to participate in 'Teacher's Day' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 28.11.2021 – 30.11.2021. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	Teacher's Day	
<b>Type of the Activity</b>	Human Values and Professional Ethics	
<b>Date and time of the Activity</b>	05.09.2018	11.00am
<b>Details of Particulars</b>	100 students participated	
<b>Coordinator</b>	Dr.Paul Richards	
<b>Organizing Dept./Support system</b>	NSS Unit	
<b>Description</b>	B.Pharmacy Final Year students of Unity College of Pharmacy has organized Teacher's Day. As a part of this program, all the teachers of unity College of Pharmacy were felicitated by the students	
<b>Photos</b>		




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**06.03.2018**


**CIRCULAR**

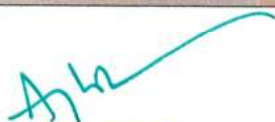
It is hereby informed to all the staff and students that to participate in '**International Women's Day**' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 08.03.2018. In this regard you are informed to participate in this program and make it success.

  
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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>International Women's Day</b>	
<b>Type of the Activity</b>	Human Values and Professional Ethics	
<b>Date and time of the Activity</b>	<b>08.03.2018</b>	<b>3.00pm</b>
<b>Details of Particulars</b>	<b>140 students participated</b>	
<b>Coordinator</b>	<b>P.Goverdhan Reddy</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Social Awareness, NSS Unit of Unity College of Pharmacy has organized Women's Day 2018. All the B.Pharmacy, M.Pharmacy students and Teaching Faculty participated	
<b>Photos</b>		



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**CIRCULAR**

**02.10.2018**

It is hereby informed to all the staff and students that to participate in 'Traditional Day' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 04.10.2018. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Traditional Day</b>	
<b>Type of the Activity</b>	Human values and professional ethics	
<b>Date and time of the Activity</b>	<b>04.10.2018</b>	<b>3.00pm</b>
<b>Details of Particulars</b>	<b>100 students participated</b>	
<b>Coordinator</b>	<b>Immadi Rajeev</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Social and Cultural Awareness , Unity College of Pharmacy has organized Traditional Day. All the B.Pharmacy, M.Pharmacy students and Teaching Faculty participated	
<b>Photos</b>		

  
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**CIRCULAR**

**10.10.2018**

It is hereby informed to all the staff and students that to participate in '**Bathukamma Celebrations**' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 12.10.2018. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>Bathukamma Celebrations 2018</b>	
<b>Type of the Activity</b>	<b>Human Values and Professional Ethics</b>	
<b>Date and time of the Activity</b>	<b>12.10.2018</b>	<b>11.00am</b>
<b>Details of Particulars</b>	<b>100 students participated</b>	
<b>Coordinator</b>	<b>Vishwavani</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Social Scheme, Unity College of Pharmacy has conducted Bathukamma Festival Celebrations. As a part of this program, competition has conducted and College Chairman Sri.A.Prabhakar Reddy garu has distributed Prizes to the winners.	
<b>Photos</b>		

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**CIRCULAR**

**23.09.2018**

It is hereby informed to all the staff and students that to participate in 'World's Pharmacist Day' organized by NSS Unit , Unity College of Pharmacy, Raigir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 25.09.2018. In this regard you are informed to participate in this program and make it success.




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## ACTIVITY REPORT

<b>Name of the Activity</b>	<b>World Pharmacist Day</b>	
<b>Type of the Activity</b>	<b>Professional Awareness Scheme</b>	
<b>Date and time of the Activity</b>	<b>25.09.2018</b>	<b>3.00pm</b>
<b>Details of Particulars</b>	<b>100 students participated</b>	
<b>Coordinator</b>	<b>Dr.V.Kiran</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	As a Part of Social and Professional Awareness Scheme , Unity College of Pharmacy has organized World Pharmacist Day 2018 on 25 <sup>th</sup> September 2018. As a part of this program All the B.Pharmacy, M.Pharmacy students and Teaching Faculty participated. As a part of this program, prizes will be distributed to the winners of various events.	
<b>Photos</b>		

  
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**CIRCULAR**

**21.12.2017**

It is hereby informed to all the staff and students that to participate in 'National Former Day' organized by NSS Unit , Unity College of Pharmacy, Ragir (V), Bhongir(M), Yadadri Bhuvanagiri Dist on 23.12.2017. In this regard you are informed to participate in this program and make it success.



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**ACTIVITY REPORT**

<b>Name of the Activity</b>	<b>National Former Day</b>	
<b>Type of the Activity</b>	<b>Human Values and Professional Ethics</b>	
<b>Date and time of the Activity</b>	<b>23.12.2017</b>	<b>11.00am</b>
<b>Details of Particulars</b>	<b>130 students participated</b>	
<b>Coordinator</b>	<b>B.Sudhakar</b>	
<b>Organizing Dept./Support system</b>	<b>NSS Unit</b>	
<b>Description</b>	NSS Unity of Unity College of Pharmacy has organized National Formers Day at Yadagirigutta on 23.12.2017. Mr. P.Shekar Reddy, MLA Bhuvanagiri has attended asd Chief Guest. College Chairman Shree A.Prabhakr Reddy, Director P.Goverdhan Reddy, principal Dr.V.Kirna Kumar, staff and students has participated in this Program.	
<b>Photos</b>		

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**Institution integrates cross cutting issues relevant to Gender,  
Environmental Sustainability and Human Values and Professional  
Ethics into the curriculum**



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## PS101: HUMAN ANATOMY AND PHYSIOLOGY- I

B. Pharm. I Year I Sem

L T P C  
3 1 0 3

**Scope:** This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

**Course Objectives:** Upon completion of this course the student should be able to

- Explain the gross morphology, structure, and functions of various organs of the human body.
- Describe the various homeostatic mechanisms and their imbalances.
- Identify the various tissues and organs of different systems of human body.
- Perform the various experiments related to special senses and nervous system.
- Appreciate coordinated working pattern of different organs of each system

### Unit – I 10 hours

#### Introduction to human body

Definition and scope of anatomy and physiology, levels of structural organization and body systems, basic life processes, homeostasis, basic anatomical terminology.

#### Cellular level of organization

Structure and functions of cell, transport across cell membrane, cell division, cell junctions. General principles of cell communication, intracellular signaling pathway activation by extracellular signal molecule, Forms of intracellular signaling: a) Contact-dependent b) Paracrine c) Synaptic d) Endocrine

#### Tissue level of organization

Classification of tissues, structure, location and functions of epithelial, muscular and nervous and connective tissues.

### Unit – II 10 hours

**Integumentary system** Structure and functions of skin

#### Skeletal system

Divisions of skeletal system, types of bone, salient features, and functions of bones of axial and appendicular skeletal system

Organization of skeletal muscle, physiology of muscle contraction, neuromuscular junction

#### Joints

Structural and functional classification, types of joints movements and its articulation

### Unit – III 10 hours

#### Nervous system

Organization of nervous system, neuron, neuroglia, classification and properties of nerve fibre, electrophysiology, action potential, nerve impulse, receptors, synapse, neurotransmitters.

Central nervous system: Meninges, ventricles of brain and cerebrospinal fluid. Structure and functions of brain (cerebrum, brain stem, cerebellum), spinal cord (gross structure, functions of afferent and efferent nerve tracts, reflex activity)

### Unit – IV 08 hours

#### Peripheral nervous system:

Classification of peripheral nervous system: Structure and functions of sympathetic and parasympathetic nervous system. Origin and functions of spinal and cranial nerves.

#### Special senses

Structure and functions of eye, ear, nose and tongue and their disorders.

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**Unit – V 07 hours**

**Endocrine system**

Classification of hormones, mechanism of hormone action, structure and functions of pituitary gland, thyroid gland, parathyroid gland, adrenal gland, pancreas, pineal gland, thymus and their disorders.

**TEXTBOOKS: (Latest Editions)**

1. Essentials of Medical Physiology by K. Sembulingam and P. Sembulingam. Jaypee brothers medical publishers, New Delhi.
2. Anatomy and Physiology in Health and Illness by Kathleen J.W. Wilson, Churchill Livingstone, New York
3. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, River view, MI USA
4. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
5. Principles of Anatomy and Physiology by Tortora Grabowski. Palmetto, GA, U.S.A.
6. Textbook of Human Histology by Inderbir Singh, Jaypee brother's medical publishers, New Delhi.
7. Textbook of Practical Physiology by C.L. Ghai, Jaypee brother's medical publishers, New Delhi.
8. Practical workbook of Human Physiology by K. Srinageswari and Rajeev Sharma, Jaypee brother's medical publishers, New Delhi.

**REFERENCE BOOKS: (Latest Editions)**

1. Physiological basis of Medical Practice-Best and Tailor. Williams & Wilkins Co, Riverview, MI USA
2. Text book of Medical Physiology- Arthur C, Guyton and John. E. Hall. Miamisburg, OH, U.S.A.
3. Human Physiology (vol 1 and 2) by Dr. C.C. Chatterje ,Academic Publishers Kolkata



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**PS108: HUMAN ANATOMY AND PHYSIOLOGY - I Lab**

**B. Pharm. I Year I Sem**

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Practical physiology is complimentary to the theoretical discussions in physiology. Practicals allow the verification of physiological processes discussed in theory classes through experiments on living tissue, intact animals, or normal human beings. This is helpful for developing an insight on the subject.

1. Study of compound microscope.
2. Microscopic study of epithelial and connective tissue
3. Microscopic study of muscular and nervous tissue
4. Identification of axial bones
5. Identification of appendicular bones
6. To study the integumentary and special senses using specimen, models, etc.,
7. To study the nervous system using specimen, models, etc.,
8. To study the endocrine system using specimen, models, etc
9. To demonstrate the general neurological examination
10. To demonstrate the function of olfactory nerve
11. To examine the different types of taste.
12. To demonstrate the visual acuity
13. To demonstrate the reflex activity
14. Recording of body temperature
15. To demonstrate positive and negative feedback mechanism.



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## PS201: HUMAN ANATOMY AND PHYSIOLOGY - II

**B. Pharm. I Year II Sem**

**L T P C**  
**3 1 0 3**

**Scope:** This subject is designed to impart fundamental knowledge on the structure and functions of the various systems of the human body. It also helps in understanding both homeostatic mechanisms. The subject provides the basic knowledge required to understand the various disciplines of pharmacy.

**Course Objectives:** Upon completion of this course the student should be able to:

- Explain the gross morphology, structure, and functions of various organs of the human body.
- Describe the various homeostatic mechanisms and their imbalances.
- Identify the various tissues and organs of different systems of human body.
- Perform the hematological tests like blood cell counts, hemoglobin estimation, bleeding/clotting time etc and also record blood pressure, heart rate, pulse and respiratory volume.
- Appreciate coordinated working pattern of different organs of each system
- Appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body.

### **Unit – I 10 hours**

#### **Body fluids and blood**

Body fluids, composition and functions of blood, hemopoiesis, formation of hemoglobin, anemia, mechanisms of coagulation, blood grouping, Rh factors, transfusion, its significance and disorders of blood, Reticulo endothelial system.

#### **Lymphatic system**

Lymphatic organs and tissues, lymphatic vessels, lymph circulation and functions of lymphatic system

### **Unit – II 10 hours**

#### **Cardiovascular system**

Heart – anatomy of heart, blood circulation, blood vessels, structure and functions of artery, vein and capillaries, elements of conduction system of heart and heart beat, its regulation by autonomic nervous system, cardiac output, cardiac cycle. Regulation of blood pressure, pulse, electrocardiogram and disorders of heart.

### **Unit – III 06 hours**

#### **Digestive system**

Anatomy of GI Tract with special reference to anatomy and functions of stomach, ( Acid production in the stomach, regulation of acid production through parasympathetic nervous system, pepsin role in protein digestion) small intestine and large intestine, anatomy and functions of salivary glands, pancreas and liver, movements of GIT, digestion and absorption of nutrients and disorders of GIT.

#### **Respiratory system**

Anatomy of respiratory system with special reference to anatomy of lungs, mechanism of respiration, regulation of respiration

### **Unit – IV 10 hours**

#### **Respiratory system**

Lung Volumes and capacities transport of respiratory gases, artificial respiration, and resuscitation methods.

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**PS207: PHARMACEUTICAL ORGANIC CHEMISTRY - I LAB**

**B. Pharm. I Year II Sem**

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1. Systematic qualitative analysis of unknown organic compounds like
  1. Preliminary test: Color, odour, aliphatic/aromatic compounds, saturation and unsaturation, etc.
  2. Detection of elements like Nitrogen, Sulphur and Halogen by Lassaigne's test
  3. Solubility test
  4. Functional group test like Phenols, Amides/ Urea, Carbohydrates, Amines, Carboxylic acids, Aldehydes and Ketones, Alcohols, Esters, Aromatic and Halogenated Hydrocarbons, Nitro compounds and Anilides.
  5. Melting point/Boiling point of organic compounds
  6. Identification of the unknown compound from the literature using melting point/ boiling point.
  7. Preparation of the derivatives and confirmation of the unknown compound by melting point/ boiling point.
  8. Minimum 5 unknown organic compounds to be analysed systematically.
2. Preparation of suitable solid derivatives from organic compounds
3. Construction of molecular models



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## BS203: BIOCHEMISTRY

**B. Pharm. I Year II Sem**

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**Scope:** Biochemistry deals with complete understanding of the molecular levels of the chemical process associated with living cells. The scope of the subject is providing biochemical facts and the principles to understand metabolism of nutrient molecules in physiological and pathological conditions. It is also emphasizing on genetic organization of mammalian genome and hetero & autocatalytic functions of DNA.

**Course Objectives:** Upon completion of course student shall able to

- Understand the catalytic role of enzymes, importance of enzyme inhibitors in design of new drugs, therapeutic and diagnostic applications of enzymes.
- Understand the metabolism of nutrient molecules in physiological and pathological conditions.
- Understand the genetic organization of mammalian genome and functions of DNA in the synthesis of RNAs and proteins.

### UNIT – I 10 Hours

#### Carbohydrate metabolism

Glycolysis – Pathway, energetics and significance Citric acid cycle- Pathway, energetics and significance

HMP shunt and its significance; Glucose-6-Phosphate dehydrogenase (G6PD) deficiency

Glycogen metabolism Pathways and glycogen storage diseases (GSD) Gluconeogenesis- Pathway and its significance

Hormonal regulation of blood glucose level and Diabetes mellitus

#### Biological oxidation

Electron transport chain (ETC) and its mechanism. Oxidative phosphorylation & its mechanism and substrate level phosphorylation, Inhibitors ETC and oxidative phosphorylation/Uncouplers

### UNIT - II 10 Hours

#### Lipid metabolism

β-Oxidation of saturated fatty acid (Palmitic acid)

Formation and utilization of ketone bodies; ketoacidosis De novo synthesis of fatty acids (Palmitic acid)

Biological significance of cholesterol and conversion of cholesterol into bile acids, steroid hormone and vitamin D

Disorders of lipid metabolism: Hypercholesterolemia, atherosclerosis, fatty liver and obesity.

#### Amino acid metabolism

General reactions of amino acid metabolism: Transamination, deamination & decarboxylation, urea cycle and its disorders

Catabolism of phenylalanine and tyrosine and their metabolic disorders (Phenylketonuria, Albinism, alpeptonuria, tyrosinemia)

Synthesis and significance of biological substances; 5-HT, melatonin, dopamine, noradrenaline, adrenaline

Catabolism of heme; hyperbilirubinemia and jaundice

### UNIT – III 10 Hours

**Nucleic acid metabolism and genetic information transfer** Biosynthesis of purine and pyrimidine nucleotides

Catabolism of purine nucleotides and Hyperuricemia and Gout disease Organization of mammalian genome

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Structure of DNA and RNA and their functions DNA replication (semi conservative model)  
Transcription or RNA synthesis  
Genetic code, Translation or Protein synthesis and inhibitors

#### **UNIT – IV 08 Hours**

##### **Biomolecules**

Introduction, classification, chemical nature and biological role of carbohydrate, lipids, nucleic acids, amino acids and proteins.

##### **Bioenergetics**

Concept of free energy, endergonic and exergonic reaction, Relationship between free energy, enthalpy and entropy; Redox potential.

Energy rich compounds; classification; biological significances of ATP and cyclic AMP

#### **UNIT – V 07 Hours**

##### **Enzymes**

Introduction, properties, nomenclature, and IUB classification of enzymes Enzyme kinetics (Michaelis plot, Line Weaver Burke plot)


Enzyme inhibitors with examples

Regulation of enzymes: enzyme induction and repression, allosteric enzymes regulation

Therapeutic and diagnostic applications of enzymes and isoenzymes Coenzymes –Structure and biochemical functions

#### **TEXTBOOKS: (Latest Editions)**

1. Principles of Biochemistry by Lehninger.
2. Harper's Biochemistry by Robert K. Murry, Daryl K. Granner and Victor W. Rodwell.
3. Biochemistry by Stryer.
4. Biochemistry by D. Satyanarayan and U.Chakrapani
5. Textbook of Biochemistry by Rama Rao.
6. Textbook of Biochemistry by Deb.
7. Outlines of Biochemistry by Conn and Stumpf
8. Practical Biochemistry by R.C. Gupta and S. Bhargavan.
9. Introduction of Practical Biochemistry by David T. Plummer. (3rd Edition)
10. Practical Biochemistry for Medical students by Rajagopal and Ramakrishna.
11. Practical Biochemistry by Harold Varley.

  
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## BS204: PATHOPHYSIOLOGY

B. Pharm. I Year II Sem

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**Scope:** Pathophysiology is the study of causes of diseases and reactions of the body to such disease producing causes. This course is designed to impart a thorough knowledge of the relevant aspects of pathology of various conditions with reference to its pharmacological applications, and understanding of basic pathophysiological mechanisms. Hence it will not only help to study the syllabus of pathology, but also to get baseline knowledge required to practice medicine safely, confidently, rationally and effectively.

**Course Objectives:** Upon completion of the subject student shall be able to–

- Describe the etiology and pathogenesis of the selected disease states;
- Name the signs and symptoms of the diseases; and
- Mention the complications of the diseases.

### Unit – I 10 Hours

#### **Basic principles of Cell injury and Adaptation:**

Introduction, definitions, Homeostasis, Components and Types of Feedback systems, Causes of cellular injury, Pathogenesis (Cell membrane damage, Mitochondrial damage, Ribosome damage, Nuclear damage), Morphology of cell injury – Adaptive changes (Atrophy, Hypertrophy, hyperplasia, Metaplasia, Dysplasia), Cell swelling, Intra cellular accumulation, Calcification, Enzyme leakage and Cell Death Acidosis & Alkalosis, Electrolyte imbalance

#### **Basic mechanism involved in the process of inflammation and repair:**

Introduction, Clinical signs of inflammation, Different types of Inflammation, Mechanism of Inflammation – Alteration in vascular permeability and blood flow, migration of WBC's, Mediators of inflammation, Basic principles of wound healing in the skin, Pathophysiology of Atherosclerosis

### Unit – II 10 Hours

#### **Cardiovascular System:**

Hypertension, congestive heart failure, ischemic heart disease (angina, myocardial infarction, atherosclerosis, and arteriosclerosis)

**Respiratory system:** Asthma, Chronic obstructive airways diseases.

**Renal system:** Acute and chronic renal failure

### Unit - III 10 Hours

#### **Haematological Diseases:**

Iron deficiency, megaloblastic anemia (Vit B12 and folic acid), sickle cell anemia, thalasemia, hereditary acquired anemia, hemophilia

**Endocrine system:** Diabetes, thyroid diseases, disorders of sex hormones

**Nervous system:** Epilepsy, Parkinson's disease, stroke, psychiatric disorders: depression, schizophrenia and Alzheimer's disease.

**Gastrointestinal system:** Peptic Ulcer

### Unit – IV 8 Hours

Inflammatory bowel diseases, jaundice, hepatitis (A, B, C, D, E, F) alcoholic liver disease.

**Disease of bones and joints:** Rheumatoid arthritis, osteoporosis, and gout

**Principles of cancer:** classification, etiology and pathogenesis of cancer

**Diseases of bones and joints:** Rheumatoid Arthritis, Osteoporosis, Gout

**Principles of Cancer:** Classification, etiology and pathogenesis of Cancer

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**Unit – V 7 Hours**

**Infectious diseases:** Meningitis, Typhoid, Leprosy, Tuberculosis Urinary tract infections


**Sexually transmitted diseases:** AIDS, Syphilis, Gonorrhoea

**TEXTBOOKS: (Latest Editions)**

1. Vinay Kumar, Abul K. Abas, Jon C. Aster; Robbins & Cotran Pathologic Basis of Disease; South Asia edition; India; Elsevier; 2014.
2. Harsh Mohan; Text book of Pathology; 6<sup>th</sup> edition; India; Jaypee Publications; 2010.
3. Laurence B, Bruce C, Bjorn K. ; Goodman Gilman's The Pharmacological Basis of Therapeutics; 12<sup>th</sup> edition; New York; McGraw-Hill; 2011.
4. Best, Charles Herbert 1899-1978; Taylor, Norman Burke 1885-1972; West, John B (John Burnard); Best and Taylor's Physiological basis of medical practice; 12th ed; united states;
5. William and Wilkins, Baltimore; 1991 [1990 printing].
6. Nicki R. Colledge, Brian R. Walker, Stuart H. Ralston; Davidson's Principles and Practice of Medicine; 21<sup>st</sup> edition; London; ELBS/Churchill Livingstone; 2010.
7. Guyton A, John .E Hall; Textbook of Medical Physiology; 12<sup>th</sup> edition; WB Saunders Company; 2010.
8. Joseph Di Piro, Robert L. Talbert, Gary Yee, Barbara Wells, L. Michael Posey; Pharmacotherapy: A Pathophysiological Approach; 9<sup>th</sup> edition; London; McGraw-Hill Medical; 2014.
9. V. Kumar, R. S. Cotran and S. L. Robbins; Basic Pathology; 6<sup>th</sup> edition; Philadelphia; WB Saunders Company; 1997.
10. Roger Walker, Clive Edwards; Clinical Pharmacy and Therapeutics; 3<sup>rd</sup> edition; London; Churchill Livingstone publication; 2003.

**RECOMMENDED JOURNALS:**

1. The Journal of Pathology. ISSN: 1096-9896 (Online)
2. The American Journal of Pathology. ISSN: 0002-9440
3. Pathology. 1465-3931 (Online)
4. International Journal of Physiology, Pathophysiology and Pharmacology. ISSN: 1944-8171 (Online)
5. Indian Journal of Pathology and Microbiology. ISSN-0377-4929.

  
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## BS303: PHARMACEUTICAL MICROBIOLOGY

B. Pharm. II Year I Sem

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### Course Objectives:

In the broadest sense, scope of microbiology is the study of all organisms that are invisible to the naked eye- that is the study of microorganisms.

Microorganisms are necessary for the production of bread, cheese, beer, antibiotics, vaccines, vitamins, enzymes etc.

Microbiology has an impact on medicine, agriculture, food science, ecology, genetics, biochemistry, immunology etc.

**Course Outcomes:** Upon completion of the subject student shall be able to;

- Understand methods of identification, cultivation and preservation of various microorganisms
- Importance of sterilization in microbiology. and pharmaceutical industry
- Learn sterility testing of pharmaceutical products.
- Microbiological standardization of Pharmaceuticals.
- Understand the cell culture technology and its applications in pharmaceutical industries.

### UNIT-I

10 Hours

Introduction, history of microbiology, its branches, scope and its importance. Introduction to Prokaryotes and Eukaryotes. Study of ultra-structure and morphological classification of bacteria, nutritional requirements, raw materials used for culture media and physical parameters for growth, growth curve, isolation and preservation methods for pure cultures, cultivation of anaerobes, quantitative measurement of bacterial growth (total & viable count). Study of different types of phase contrast microscopy, dark field microscopy and electron microscopy.

### UNIT-II

10 Hours

Identification of bacteria using staining techniques (simple, Gram's & Acid fast staining) and biochemical tests (IMViC). Study of principle, procedure, merits, demerits and applications of Physical, chemical and mechanical method of sterilization. Evaluation of the efficiency of sterilization methods. Equipments employed in large scale sterilization. Sterility indicators.

### UNIT-III

10 Hours

Study of morphology, classification, reproduction/replication and cultivation of Fungi and Virus. Classification and mode of action of disinfectants. Factors influencing disinfection, antiseptics and their evaluation. For bacteriostatic and bactericidal actions. Evaluation of bactericidal & Bacteriostatic. Sterility testing of products (solids, liquids, ophthalmic and other sterile products) according to IP, BP and USP.

**UNIT-IV****08 Hours**

Designing of aseptic area, laminar flow equipments; study of different sources of contamination in an aseptic area and methods of prevention, clean area classification. Principles and methods of different microbiological assay. Methods for standardization of antibiotics, vitamins and amino acids. Assessment of a new antibiotic and testing of antimicrobial activity of a new substance. General aspects-environmental cleanliness.


**UNIT-V****07 Hours**

Types of spoilage, factors affecting the microbial spoilage of pharmaceutical products, sources and types of microbial contaminants, assessment of microbial contamination and spoilage.

Preservation of pharmaceutical products using antimicrobial agents, evaluation of microbial stability of formulations. Growth of animal cells in culture, general procedure for cell culture, Primary, established and transformed cell cultures. Application of cell cultures in pharmaceutical industry and research.

**Recommended Books (Latest edition)**

1. Rafi MD, Text book of biochemistry for undergraduates, 3<sup>rd</sup> edition, Universities press, 2017.
2. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
3. Prescott and Dunn, Industrial Microbiology, 4<sup>th</sup> edition, CBS Publishers & Distributors, Delhi.
4. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
5. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
6. Rose: Industrial Microbiology.
7. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
8. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
9. Pepler: Microbial Technology.
10. I.P., B.P., U.S.P.- latest editions.
11. Edward: Fundamentals of Microbiology.
12. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
13. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company
14. Ananthanarayan and Paniker's textbook of Microbiology tenth edition

  
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## BS307: PHARMACEUTICAL MICROBIOLOGY LAB

**B. Pharm. II Year I Sem**


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### List of Experiments:

1. Introduction and study of different equipments and processing, e.g., B.O.D. incubator, laminar flow, aseptic hood, autoclave, hot air sterilizer, deep freezer, refrigerator, microscopes used in experimental microbiology.
2. Sterilization of glassware, preparation and sterilization of media.
3. Sub culturing of bacteria and fungus. Nutrient stabs and slants preparations.
4. Staining methods- Simple, Grams staining and acid fast staining (Demonstration with practical).
5. Isolation of pure culture of micro-organisms by multiple streak plate technique and other techniques.
6. Microbiological assay of antibiotics by cup plate method and other methods
7. Motility determination by Hanging drop method.
8. Sterility testing of pharmaceuticals.
9. Bacteriological analysis of water
10. Biochemical test (IMViC reactions)
11. Revision Practical Class

### Recommended Books (Latest edition)

1. W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.
2. Prescott and Dunn., Industrial Microbiology, 4<sup>th</sup> edition, CBS Publishers & Distributors, Delhi.
3. Pelczar, Chan Kreig, Microbiology, Tata McGraw Hill edn.
4. Malcolm Harris, Balliere Tindall and Cox: Pharmaceutical Microbiology.
5. Rose: Industrial Microbiology.
6. Probisher, Hinsdill et al: Fundamentals of Microbiology, 9th ed. Japan
7. Cooper and Gunn's: Tutorial Pharmacy, CBS Publisher and Distribution.
8. Peppler: Microbial Technology.
9. I.P., B.P., U.S.P.- latest editions.
10. Ananthnarayan : Text Book of Microbiology, Orient-Longman, Chennai
11. Edward: Fundamentals of Microbiology.
12. N.K.Jain: Pharmaceutical Microbiology, Vallabh Prakashan, Delhi
13. Bergeys manual of systematic bacteriology, Williams and Wilkins- A Waverly company

  
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## PC404: PHARMACOLOGY - I

B. Pharm. II Year II Sem

L T P C  
3 1 0 4

**Course Objectives:** The main purpose of the subject is to understand what drugs do to the living organisms and how their effects can be applied to therapeutics. The subject covers the information about the drugs like, mechanism of action, physiological and biochemical effects (pharmacodynamics) as well as absorption, distribution, metabolism and excretion (pharmacokinetics) along with the adverse effects, clinical uses, interactions, doses, contraindications and routes of administration of different classes of drugs.

**Course Outcomes:** Upon completion of this course the student should be able to

- Understand the pharmacological actions of different categories of drugs
- Explain the mechanism of drug action at organ system/sub cellular/ macromolecular levels.
- Apply the basic pharmacological knowledge in the prevention and treatment of various diseases.
- Observe the effect of drugs on animals by simulated experiments
- Appreciate correlation of pharmacology with other bio medical sciences

### UNIT-I

08 hours

#### 1. General Pharmacology

- a. Introduction to Pharmacology- Definition, historical landmarks and scope of pharmacology, nature and source of drugs, essential drugs concept and routes of drug administration, Agonists, antagonists( competitive and non competitive), spare receptors, addiction, tolerance, dependence, tachyphylaxis, idiosyncrasy, allergy.
- b. Pharmacokinetics- Membrane transport, absorption, distribution, metabolism and excretion of drugs .Enzyme induction, enzyme inhibition, kinetics of elimination

### UNIT-II

10 Hours

#### General Pharmacology

Pharmacodynamics- Principles and mechanisms of drug action. Receptor theories and classification of receptors, regulation of receptors. drug receptors interactions signal transduction mechanisms, G-protein-coupled receptors, ion channel receptor, transmembrane enzyme linked receptors, transmembrane JAK-STAT binding receptor and receptors that regulate transcription factors, dose response relationship, therapeutic index, combined effects of drugs and factors modifying drug action.

- a. Adverse drug reactions.
- b. Drug interactions (pharmacokinetic and pharmacodynamic)
- c. Drug discovery and clinical evaluation of new drugs -Drug discovery phase, preclinical evaluation phase, clinical trial phase, phases of clinical trials and pharmacovigilance.



**UNIT-III****10 Hours****2. Pharmacology of peripheral nervous system**

- a. Organization and function of ANS.
- b. Neurohumoral transmission, co-transmission and classification of neurotransmitters.
- c. Parasympathomimetics, Parasympatholytics, Sympathomimetics, sympatholytics.
- d. Neuromuscular blocking agents and skeletal muscle relaxants (peripheral).
- e. Local anesthetic agents.
- f. Drugs used in myasthenia gravis and glaucoma

**UNIT-IV****10 Hours****3. Pharmacology of central nervous system**

- a. Neurohumoral transmission in the C.N.S. special emphasis on importance of various neurotransmitters like with GABA, Glutamate, Glycine, serotonin, dopamine.
- b. General anesthetics and pre-anesthetics.
- c. Sedatives, hypnotics and centrally acting muscle relaxants.
- d. Anti-epileptics
- e. Alcohols and disulfiram

**UNIT-V****7 Hours****Pharmacology of central nervous system 07 Hours**

- a. Psychopharmacological agents: Antipsychotics, antidepressants, anti-anxiety agents, anti-manics and hallucinogens.
- b. Drugs used in Parkinsons disease and Alzheimer's disease.
- c. CNS stimulants and nootropics.
- d. Opioid analgesics and antagonists
- e. Drug addiction, drug abuse, tolerance and dependence.

**Recommended Books (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology
6. K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert,
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan,

## PC408: PHARMACOLOGY – I LAB

**B. Pharm. II Year II Sem**

**L T P C**  
**0 0 4 2**

### **List of Experiments:**

1. Introduction to experimental pharmacology.
2. Commonly used instruments in experimental pharmacology.
3. Study of common laboratory animals.
4. Maintenance of laboratory animals as per CPCSEA guidelines.
5. Common laboratory techniques. Blood withdrawal, serum and plasma separation, anesthetics and euthanasia used for animal studies.
6. Study of different routes of drugs administration in mice/rats.
7. Study of effect of hepatic microsomal enzyme inducers on the phenobarbitone sleeping time in mice.
8. Effect of drugs on ciliary motility of frog oesophagus
9. Effect of drugs on rabbit eye.
10. Effects of skeletal muscle relaxants using rota-rod apparatus.
11. Effect of drugs on locomotor activity using actophotometer.
12. Anticonvulsant effect of drugs by MES and PTZ method.
13. Study of stereotype and anti-catatonic activity of drugs on rats/mice.
14. Study of anxiolytic activity of drugs using rats/mice.
15. Study of local anesthetics by different methods

*Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos*

### **Recommended Books (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews- Pharmacology
6. K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert.
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan,

## MC400: GENDER SENSITIZATION LAB

B. Pharm. II Year II Sem

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### Course Objectives:

- To develop students' sensibility with regard to issues of gender in contemporary India.
- To provide a critical perspective on the socialization of men and women.
- To introduce students to information about some key biological aspects of genders.
- To expose the students to debates on the politics and economics of work.
- To help students reflect critically on gender violence.
- To expose students to more egalitarian interactions between men and women.

### Course Outcomes:

- Students will have developed a better understanding of important issues related to gender in contemporary India.
- Students will be sensitized to basic dimensions of the biological, sociological, psychological and legal aspects of gender. This will be achieved through discussion of materials derived from research, facts, everyday life, literature and film.
- Students will attain a finer grasp of how gender discrimination works in our society and how to counter it.
- Students will acquire insight into the gendered division of labour and its relation to politics and economics.
- Men and women students and professionals will be better equipped to work and live together as equals.
- Students will develop a sense of appreciation of women in all walks of life.
- Through providing accounts of studies and movements as well as the new laws that provide protection and relief to women, the textbook will empower students to understand and respond to gender violence.

### UNIT-I

#### UNDERSTANDING GENDER

**Gender:** Why Should We Study It? (*Towards a World of Equals*: Unit -1)

**Socialization:** Making Women, Making Men (*Towards a World of Equals*: Unit -2)

Introduction. Preparing for Womanhood. Growing up Male. First lessons in Caste. Different Masculinities.

### UNIT-II

#### GENDER AND BIOLOGY

**Missing Women:** Sex Selection and Its Consequences (*Towards a World of Equals*: Unit -4)  
Declining Sex Ratio. Demographic Consequences.

**Gender Spectrum:** Beyond the Binary (*Towards a World of Equals*: Unit -10)

Two or Many? Struggles with Discrimination.

  
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### UNIT-III

#### GENDER AND LABOUR

**Housework:** the Invisible Labour (*Towards a World of Equals*: Unit -3)

“My Mother doesn’t Work.” “Share the Load.”

**Women’s Work:** Its Politics and Economics (*Towards a World of Equals*: Unit -7)

Fact and Fiction. Unrecognized and Unaccounted work. Additional Reading: Wages and Conditions of Work.

### UNIT-IV

#### ISSUES OF VIOLENCE

**Sexual Harassment:** Say No! (*Towards a World of Equals*: Unit -6)

Sexual Harassment, not Eve-teasing- Coping with Everyday Harassment- Further Reading: “Chupulu”.

**Domestic Violence:** Speaking Out (*Towards a World of Equals*: Unit -8)

Is Home a Safe Place? -When Women Unite [Film]. Rebuilding Lives. Additional Reading: New Forums for Justice.

Thinking about Sexual Violence (*Towards a World of Equals*: Unit -11)

Blaming the Victim-“I Fought for my Life....” - Additional Reading: The Caste Face of Violence.

### UNIT-V

#### GENDER: CO - EXISTENCE

**Just Relationships:** Being Together as Equals (*Towards a World of Equals*: Unit -12)

Mary Kom and Onler. Love and Acid just do not Mix. Love Letters. Mothers and Fathers. Additional Reading: Rosa Parks-The Brave Heart.

#### TEXTBOOK

All the five Units in the Textbook, “*Towards a World of Equals: A Bilingual Textbook on Gender*” written by A. Suneetha, Uma Bhrugubanda, Duggirala Vasanta, Rama Melkote, Vasudha Nagaraj, Asma Rasheed, Gogu Shyamala, Deepa Sreenivas and Susie Tharu and published by **Telugu Akademi, Hyderabad**, Telangana State in the year **2015**.

**Note:** Since it is an Interdisciplinary Course, Resource Persons can be drawn from the fields of English Literature or Sociology or Political Science or any other qualified faculty who has expertise in this field from engineering/pharmacy departments.

#### REFERENCE BOOKS:

1. Menon, Nivedita. Seeing like a Feminist. New Delhi: Zubaan-Penguin Books, 2012
2. Abdulali Sohaila. “*I Fought For My Life...and Won.*” Available online at: <http://www.thealternative.in/lifestyle/i-fought-for-my-lifeand-won-sohaila-abdulal/>



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**PS503: PHARMACOLOGY - II**

**B.Pharm. III Year I Sem.**

**L T/P/ C**  
**3 1/0/ 4**

**Course Objective:** This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on different systems of body and in addition, emphasis on the basic concepts of bioassay.

**Course Outcomes:** Upon completion of this course the student should be able to

- Understand the mechanism of drug action and its relevance in the treatment of different diseases
- Demonstrate isolation of different organs/tissues from the laboratory animals by simulated experiments
- Demonstrate the various receptor actions using isolated tissue preparation
- Appreciate correlation of pharmacology with related medical sciences

**UNIT - I**

**10 hours**

**Pharmacology of drugs acting on cardio vascular system**

- a. Introduction to hemodynamic and electrophysiology of heart.
- b. Drugs used in congestive heart failure
- c. Anti-hypertensive drugs.
- d. Anti-anginal drugs.
- e. Anti-arrhythmic drugs.
- f. Anti-hyperlipidemic drugs.

**UNIT – II**

**10 hours**

**1. Pharmacology of drugs acting on cardio vascular system**

- a. Drug used in the therapy of shock.
- b. Hematinics, coagulants and anticoagulants.
- c. Fibrinolytics and anti-platelet drugs
- d. Plasma volume expanders

**2. Pharmacology of drugs acting on urinary system**

- a. Diuretics
- b. Anti-diuretics.

**UNIT - III**

**10 hours**

**Autocoids and related drugs**


- a. Introduction to autacoids and classification
- b. Histamine, 5-HT and their antagonists.
- c. Prostaglandins, Thromboxanes and Leukotrienes.
- d. Angiotensin, Bradykinin and Substance P.
- e. Non-steroidal anti-inflammatory agents
- f. Anti-gout drugs
- g. Antirheumatic drugs

**UNIT - IV**

**08 hours**

**Pharmacology of drugs acting on endocrine system**

- a. Basic concepts in endocrine pharmacology.

  
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- b. Anterior Pituitary hormones- analogues and their inhibitors.
- c. Thyroid hormones- analogues and their inhibitors.
- d. Hormones regulating plasma calcium level- Parathormone, Calcitonin and Vitamin-D.
- e. Insulin, Oral Hypoglycemic agents and glucagon.
- f. ACTH and corticosteroids.


**UNIT - V**

**07 hours**

- 1. Pharmacology of drugs acting on endocrine system**
  - a. Androgens and Anabolic steroids.
  - b. Estrogens, progesterone and oral contraceptives.
  - c. Drugs acting on the uterus.
- 2. Bioassay**
  - a. Principles and applications of bioassay.
  - b. Types of bioassay
  - c. Bioassay of insulin, oxytocin, vasopressin, ACTH, d-tubocurarine, digitalis, histamine

**TEXT BOOKS (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology,
2. Churchill Livingstone Elsevier
3. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.
4. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
5. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins.
6. Mycek M. J, Gelnet S. B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology.
7. K. D. Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
8. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
9. Modern Pharmacology with clinical Applications, by Charles R. Craig & Robert.
10. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
11. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan.

  
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**PS506: GREEN CHEMISTRY**  
**(Open Elective - I)**

**B.Pharm. III Year I Sem.**

**L T/P/ C**  
**3 1/0/ 4**

**Course Objectives:** To familiarize students about environment benign chemical synthesis. To make students familiarize with principles and importance of various green chemical synthesis. To provide adequate knowledge regarding green reactions, green solvents and other alternative green approaches. To impart adequate information regarding environment pollution, contributing factors and the concerns.

**Course Outcomes:** Upon completion of this course, the students should be able to: Explain the environment pollution factors. Understand the different greener approaches along with their principles.

**UNIT - I**

**Introduction to green chemistry**

Inception of green chemistry: history and development.

Principles of green chemistry: description with examples.

Synthetic approaches of green chemistry: in water, solvent less, microwave, ultrasonic, catalytic and synthesis.

**UNIT - II**

**In water and solvent less organic reactions**

In water reactions: principle and process involved in the Michael reaction and Wartz synthesis

Solvent less organic synthesis:

Alternative solvents used in green chemistry strategies

**UNIT - III**

**Microwave and ultrasonic mediated reactions**

Microwave reactions: principles and process involved in the Fries rearrangement, Diels Alder reaction and Metal halide reduction

Ultrasonic reaction: principle and process involved in the Strecker and Reformatsky reactions

**UNIT - IV**

**Catalytic and solid supported reactions**

Catalytic reactions: principle and process involved in the reactions catalyzed by metal catalysts, ionic liquids (Knoevenagel condensation) and bio catalysts (Viliger reaction)

Solid supported reactions: principles and process

Alternative reagents used in green chemistry strategies.

**UNIT - V**


Greener synthesis of pharmaceuticals: Principle and procedure of the following synthesis

Nicotinic acid, Ibuprofen, paracetamol, Aspirin

Future trends in Green chemistry

**REFERENCE BOOKS**

1. Paul T Anastas, John Charles Warner. Green chemistry: theory and practice. Oxford university Press, 1988
2. Alluwalla V.K, Green chemistry : environmentally benign reactions. 2<sup>nd</sup> edn, Ane Books Pvt Ltd, New Delhi, 2012
3. Alluwalla V.K, M. Kidwai, New trends in green chemistry. 2<sup>nd</sup> edn, Anamaya Publishers, New delhi, 2004.

  
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## PS510: PHARMACOLOGY - II LAB

B.Pharm. III Year I Sem.

L T/P/ C  
0 0/4/ 2


### List of Experiments:

1. Introduction to *in-vitro* pharmacology and physiological salt solutions.
2. Effect of drugs on isolated frog heart.
3. Effect of drugs on blood pressure and heart rate of dog.
4. Study of diuretic activity of drugs using rats/mice.
5. DRC of acetylcholine using frog rectus abdominis muscle.
6. Effect of physostigmine and atropine on DRC of acetylcholine using frog rectus abdominis muscle and rat ileum respectively.
7. Bioassay of histamine using guinea pig ileum by matching method.
8. Bioassay of oxytocin using rat uterine horn by interpolation method.
9. Bioassay of serotonin using rat fundus strip by three point bioassay.
10. Bioassay of acetylcholine using rat ileum/colon by four point bioassay.
11. Determination of  $PA_2$  value of prazosin using rat anococcygeus muscle (by Schilds plot method).
12. Determination of  $PD_2$  value using guinea pig ileum.
13. Effect of spasmogens and spasmolytics using rabbit jejunum.
14. Anti-inflammatory activity of drugs using carrageenan induced paw-edema model.
15. Analgesic activity of drug using central and peripheral methods

Note: All laboratory techniques and animal experiments are demonstrated by simulated experiments by softwares and videos

### Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill.
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs, The Point Lippincott Williams & Wilkins.
5. Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology.
6. K.D.Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
7. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
8. Modern Pharmacology with clinical Applications, by Charles R.Craig & Robert.
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan.

  
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**\*MC500: ENVIRONMENTAL SCIENCES**

**B.Pharm. III Year I Sem.**

**L T/P/ C**  
**1 0/0/ 0**

**Course Objectives:** Environmental Sciences is the scientific study of the environmental system and the status of its inherent or induced changes on organisms. It includes not only the study of physical and biological characters of the environment but also the social and cultural factors and the impact of man on environment.

**Course Outcomes:** Upon completion of the course the student shall be able to:

- Create the awareness about environmental problems among learners.
- Impart basic knowledge about the environment and its allied problems.
- Develop an attitude of concern for the environment.
- Motivate learner to participate in environment protection and environment improvement.
- Acquire skills to help the concerned individuals in identifying and solving environmental problems.
- Strive to attain harmony with Nature.

**UNIT – I**

The Multidisciplinary nature of environmental studies

Natural Resources

Renewable and non-renewable resources:

Natural resources and associated problems

- a) Forest resources; b) Water resources; c) Mineral resources; d) Food resources; e) Energy resources; f) Land resources: Role of an individual in conservation of natural resources.

**UNIT – II**

Ecosystems

Concept of an ecosystem.

Structure and function of an ecosystem.

Introduction, types, characteristic features, structure and function of the ecosystems: Forest ecosystem; Grassland ecosystem; Desert ecosystem; Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries)

**UNIT – III**

**Biodiversity and Biotic Resources:** Introduction, Definition, genetic, species and ecosystem diversity. Value of biodiversity; consumptive use, productive use, social, ethical, aesthetic and optional values. India as a mega diversity nation, Hot spots of biodiversity. Field visit. Threats to biodiversity: habitat loss, poaching of wildlife, man-wildlife conflicts; conservation of biodiversity: In-Situ and Ex-situ conservation. National Biodiversity act.

**Unit – IV**

**Environmental Pollution:** Air pollution; Water pollution; Soil pollution, Noise Pollution

**UNIT -- V**

**Environmental Policy, Legislation & EIA:** Environmental Protection act, Legal aspects Air Act- 1981, Water Act, Forest Act, Wild life Act.

**Towards Sustainable Future:** Concept of Sustainable Development, Population and its explosion, Crazy Consumerism, Environmental Education, Urban Sprawl, Human health, Environmental Ethics, Concept of Green Building, Ecological Foot Print, Life Cycle assessment (LCA), Low carbon life style.

  
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PS602; PHARMACOLOGY - III

B.Pharm. III Year II Sem.

L T/P/ C  
3 1/0/ 4

**Course Objectives:** This subject is intended to impart the fundamental knowledge on various aspects (classification, mechanism of action, therapeutic effects, clinical uses, side effects and contraindications) of drugs acting on respiratory and gastrointestinal system, infectious diseases, immuno-pharmacology and in addition, emphasis on the principles of toxicology and chronopharmacology.

**Course Outcomes:** Upon completion of this course the student should be able to:

- Understand the mechanism of drug action and its relevance in the treatment of different infectious diseases
- Comprehend the principles of toxicology and treatment of various poisonings and appreciate correlation of pharmacology with related medical sciences.

**UNIT - I**

**10 hours**

**1. Pharmacology of drugs acting on Respiratory system**

- Anti -asthmatic drugs
- Drugs used in the management of COPD
- Expectorants and antitussives
- Nasal decongestants
- Respiratory stimulants

**2. Pharmacology of drugs acting on the Gastrointestinal Tract**

- Antiulcer agents.
- Drugs for constipation and diarrhoea.
- Appetite stimulants and suppressants.
- Digestants and carminatives.
- Emetics and anti-emetics.

**UNIT – II**

**10 hours**

**Chemotherapy**

- General principles of chemotherapy.
- Sulfonamides and cotrimoxazole.
- Antibiotics - Penicillins, cephalosporins, chloramphenicol, macrolides, quinolones and fluoroquinolins, tetracycline and aminoglycosides

**UNIT – III**

**10 hours**

**Chemotherapy**


- Antitubercular agents
- Antileprotic agents
- Antifungal agents
- Antiviral drugs
- Anthelmintics
- Antimalarial drugs
- Antiamoebic agents

**UNIT – IV**

**08 hours**

**1. Chemotherapy**

- Urinary tract infections and sexually transmitted diseases.  
Chemotherapy of malignancy.

  
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## 2. Immunopharmacology

- a. Immunostimulants
- b. Immunosuppressant
- c. Protein drugs, monoclonal antibodies, target drugs to antigen, biosimilars

### UNIT – V

07 hours

#### Principles of toxicology

- a. Definition and basic knowledge of acute, subacute and chronic toxicity.
- b. Definition and basic knowledge of genotoxicity, carcinogenicity, teratogenicity and mutagenicity
- c. General principles of treatment of poisoning
- d. Clinical symptoms and management of barbiturates, morphine, organophosphorus compound and lead, mercury and arsenic poisoning.

#### Recommended Books (Latest Editions)

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology,
2. Churchill Livingstone Elsevier
3. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
4. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
5. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs. The Point Lippincott Williams & Wilkins
6. Mycek M. J, Gelnet S. B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology
7. K. D. Tripathi. Essentials of Medical Pharmacology, , JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
8. Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher Modern Pharmacology with clinical Applications, by Charles R. Craig & Robert,
9. Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata,
10. Kulkarni SK. Handbook of experimental pharmacology. Vallabh Prakashan,
11. N. Udupa and P.D. Gupta, Concepts in Chronopharmacology.

  
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**PS610: PHARMACOLOGY - III LAB**

**B.Pharm. III Year II Sem.**

**L T/P/ C  
0 0/4/ 2**

**List of Experiments:**

1. Dose calculation in pharmacological experiments
2. Antiallergic activity by mast cell stabilization assay
3. Study of anti-ulcer activity of a drug using pylorus ligand (SHAY) rat model and NSAIDS induced ulcer model.
4. Study of effect of drugs on gastrointestinal motility
5. Effect of agonist and antagonists on guinea pig ileum
6. Estimation of serum biochemical parameters by using semi- autoanalyser
7. Effect of saline purgative on frog intestine
8. Insulin hypoglycemic effect in rabbit
9. Test for pyrogens (rabbit method)
10. Determination of acute oral toxicity (LD50) of a drug from a given data
11. Determination of acute skin irritation / corrosion of a test substance
12. Determination of acute eye irritation / corrosion of a test substance
13. Calculation of pharmacokinetic parameters from a given data
14. Biostatistics methods in experimental pharmacology (student's t test, ANOVA)
15. Biostatistics methods in experimental pharmacology (Chi square test, Wilcoxon Signed Rank test)

*\*Experiments are demonstrated by simulated experiments/videos*

**Recommended Books (Latest Editions)**

1. Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
2. Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
3. Goodman and Gilman's, The Pharmacological Basis of Therapeutics
4. Marry Anne K. K., Lloyd Yee Y., Brian K. A., Robbin L.C., Joseph G. B., Wayne A. K., Bradley R.W., Applied Therapeutics, The Clinical use of Drugs. The Point Lippincott Williams & Wilkins
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**\*MC600: HUMAN VALUES AND PROFESSIONAL ETHICS**

**B.Pharm. III Year II Sem.**

**L T/P/ C**  
**1 0/0/ 0**

**Course Objective:** To enable the students to imbibe and internalize the Values and Ethical Behavior in the personal and Professional lives.

**Course Outcome:** The students will understand the importance of Values and Ethics in their personal lives and professional careers. The students will learn the rights and responsibilities as an employee, team member and a global citizen.

**UNIT - I**

**Introduction to Professional Ethics:** Basic Concepts, Governing Ethics, Personal & Professional Ethics, Ethical Dilemmas, Life Skills, Emotional Intelligence, Thoughts of Ethics, Value Education, Dimensions of Ethics, Profession and professionalism, Professional Associations, Professional Risks, Professional Accountabilities, Professional Success, Ethics and Profession.

**UNIT - II**

**Basic Theories:** Basic Ethical Principles, Moral Developments, Deontology, Utilitarianism, Virtue Theory, Rights Theory, Casuist Theory, Moral Absolution, Moral Rationalism, Moral Pluralism, Ethical Egoism, Feminist Consequentialism, Moral Issues, Moral Dilemmas, Moral Autonomy.

**UNIT - III**

**Professional ethics in pharmacy:** general introduction to code of pharmaceutical ethics, objectives, pharmacists in relation to his job, his trade, to his profession and relation to medicinal professions. Pharmacists oath.

**UNIT - IV**

Work Place Rights & Responsibilities, Ethics in changing domains of Research, Engineers and Managers; Organizational Complaint Procedure, difference of Professional Judgment within the Nuclear Regulatory Commission (NRC), the Hanford Nuclear Reservation.


Ethics in changing domains of research - The US government wide definition of research misconduct, research misconduct distinguished from mistakes and errors, recent history of attention to research misconduct, the emerging emphasis on understanding and fostering responsible conduct, responsible authorship, reviewing & editing.

**UNIT - V**

Global issues in Professional Ethics: Introduction – Current Scenario, Technology Globalization of MNCs, International Trade, World Summits, Issues, Business Ethics and Corporate Governance, Sustainable Development Ecosystem, Energy Concerns, Ozone Deflection, Pollution, Ethics in Manufacturing and Marketing, Media Ethics; War Ethics; Bio Ethics, Intellectual Property Rights.

**TEXT BOOKS:**

1. Professional Ethics: R. Subramanian, Oxford University Press, 2015.
2. Ethics in Engineering Practice & Research, Caroline Whitbeck, 2e, Cambridge University Press 2015.

  
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**PS802: SOCIAL AND PREVENTIVE PHARMACY**

B.Pharm. IV Year II Sem.

L/T/P/ C  
3/1/0/ 4

**Course Objectives:** The purpose of this course is to introduce to students a number of health issues and their challenges. This course also introduced a number of national health programmes. The roles of the pharmacist in these contexts are also discussed.

**Course Outcomes:** After the successful completion of this course, the student shall be able to:

- Acquire high consciousness/realization of current issues related to health and pharmaceutical problems within the country and worldwide.
- Have a critical way of thinking based on current healthcare development.
- Evaluate alternative ways of solving problems related to health and pharmaceutical issues

**UNIT – I****10 Hours**

**Concept of health and disease:** Definition, concepts and evaluation of public health. Understanding the concept of prevention and control of disease, social causes of diseases and social problems of the sick.

**Social and health education:** Food in relation to nutrition and health, Balanced diet, Nutritional deficiencies, Vitamin deficiencies, Malnutrition and its prevention.

**Sociology and health:** Socio cultural factors related to health and disease, Impact of urbanization on health and disease, Poverty and health

**Hygiene and health:** personal hygiene and health care; avoidable habits

**UNIT – II****10 Hours**

**Preventive medicine:** General principles of prevention and control of diseases such as cholera, SARS, Ebola virus, influenza, acute respiratory infections, malaria, chicken guinea, dengue, lymphatic filariasis, pneumonia, hypertension, diabetes mellitus, cancer, drug addiction-drug substance abuse

**UNIT – III****10 Hours**

**National health programs, its objectives, functioning and outcome of the following:** HIV and AIDS control programme, TB, Integrated disease surveillance program (IDSP), National leprosy control programme, National mental health program, National programme for prevention and control of deafness, Universal immunization programme, National programme for control of blindness, Pulse polio programme.

**UNIT – IV****08 Hours**

National health intervention programme for mother and child, national family welfare programme, national tobacco control programme, national malaria prevention program, national programme for the health care for the elderly, social health programme; role of \*who in indian national program

**UNIT – V****07 Hours**

Community services in rural, urban and school health: Functions of PHC, Improvement in rural sanitation, national urban health mission, Health promotion and education in school.

**Recommended Books (Latest edition):**

1. Short Textbook of Preventive and Social Medicine, Prabhakara G N, 2<sup>nd</sup> Edition, 2010, ISBN: 9789380704104, JAYPEE Publications
2. Textbook of Preventive and Social Medicine (Mahajan and Gupta), Edited by Roy Rabindra Nath, Saha Indranil, 4<sup>th</sup> Edition, 2013, ISBN: 9789350901878, JAYPEE Publications

3. Review of Preventive and Social Medicine (Including Biostatistics), Jain Vivek, 6<sup>th</sup> Edition, 2014, ISBN: 9789351522331, JAYPEE Publications
4. Essentials of Community Medicine - A Practical Approach, Hiremath Lalita D, Hiremath Dhananjaya A, 2<sup>nd</sup> Edition, 2012, ISBN: 9789350250440, JAYPEE Publications
5. Park Textbook of Preventive and Social Medicine, K Park, 21<sup>st</sup> Edition, 2011, ISBN-14: 9788190128285, Banarsidas Bhanot Publishers.
6. Community Pharmacy Practice, Ramesh Adepu, BSP publishers, Hyderabad



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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.Pharm I Year I Sem (Pharmaceutics/Pharmaceutical Technology)**

**APPLIED BIOPHARMACEUTICS AND PHARMACOKINETICS (Professional Core – II)**

**Course Objectives:** The student shall know about bioavailability, bioequivalence and factor affecting bioavailability. They also know the pharmacokinetic parameter like drug disposition, absorption, non-linear and time dependant pharmacokinetics. They also know about the drug interactions & problems associated in pharmacokinetic parameters calculations.

**Course Outcomes:** students will be able to tell factors affecting the bioavailability and stability of dosage form; they also know the bioequivalence studies and protocols for bioequivalent studies. They also know the parameters for the disposition, absorption and Michaelis-Menton constants for non-linear kinetics.

**UNIT I**

- Biological and metabolic factors affecting bioavailability, complexation, dissolution - techniques of enhancing dissolution.
- Formulation factors affecting bioavailability of drugs in dosage forms of tablets, capsules, parenterals, liquid orals and topical dosage forms.
- Bioavailability:** Importance, dose dependency, AUC, rate and extent, assessment, blood and urine samples, single dose and multiple dose studies, *Invitro- Invivo* Correlation analysis and Levels of Correlations.
- Bioequivalence:** Importance equivalency concepts, biowaivers, study designs, protocol, transformation of data, Statistical Criteria as per the Regulations.

**UNIT II**

**Pharmacokinetics – Drug Disposition:** compartment models: One, two and non-compartmental approaches to pharmacokinetics. Recent trends, merits and limitations of these approaches. Application of these models to determine the various pharmacokinetic parameters pertaining to:

- Distribution: Apparent volume of distribution and its determination, factors affecting.
- Metabolism: Metabolic rate constant, Factors affecting Metabolism
- Elimination: Over all apparent elimination rate constant, and half life.  
All the above under the following conditions:
  - Intravenous infusion
  - Multiple dose injections
- Non-invasive methods of estimating pharmacokinetics parameters with emphasis on salivary and urinary samples.
- Concept of clearance: organ, total clearance, hepatic clearance, lung clearance and renal clearance.

**UNIT III**

**Pharmacokinetics – Absorption:** Rate constants – Zero order, first order, Models of experimental study of absorption (in silico, in vitro, in situ and in vivo) – Absorption half lives, method of residuals, Wagner – Nelson method, Loo - Reigleman method, Analysis of kinetics from urine samples. Pharmacokinetic parameters determination pertaining to: Multiple dosage oral administration.

**UNIT IV**

**Non-linear pharmacokinetics:** Concepts of linear and non-linear pharmacokinetics, Michaelis-Menton kinetics characteristics. Basic kinetic parameters, possible causes of non-induction, non-linear binding, and non-linearity of pharmacological responses.



**Clinical Pharmacokinetics:** Altered kinetics in pregnancy, child birth, infants and geriatrics. kinetics in GI disease, malabsorption syndrome, liver, cardiac, renal and pulmonary disease states.

#### UNIT V

**Time dependent pharmacokinetics:** Introduction, classification, physiologically induced time dependency: Chronopharmacokinetics - principles, drugs- (amino glycosides, NSAIDS, antihypertensive drug) chemically induced dependency.

**Drug Interactions:** Kinetics of drug interaction, study of drug-drug interaction mediated through absorption, distribution, metabolism and elimination, mechanisms of interaction and consequence.


❖ Numerical problems associated with all units, if any.

#### TEXT BOOKS

1. Biopharmaceutics and Clinical Pharmacokinetics by Milo Gibaldi.
2. Learn Shargel and ABC yu, Applied Biopharmacokinetics and Pharmacokinetics
3. Biopharmaceutics and Pharmacokinetics by C.V.S. Subrahmanyam, Vallabh Prakashan.2010.
4. Basic biopharmaceutics, Sunil S. Jambhekar and Philip J Brean.
5. Text book of Biopharmaceutics and Clinical Pharmacokinetics by NiaziSarfaraz

#### REFERENCE BOOKS

1. Bio-Pharmaceutics and Pharmacokinetics by V. Venkateshwarlu.
2. Pharmacokinetics, Biopharmaceutics and Clinical pharmacy by Robert E. Notari.
3. Biopharmaceutics and Clinical Pharmacokinetics - An Introduction by Robert E. Notari.
4. Drug drug interactions, scientific and regulatory perspectives by Albert P. G

  
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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD  
M.Pharm I Year II Sem (Pharmaceutics/Pharmaceutical Technology)**

**ADVANCED DRUG DELIVERY SYSTEMS (Professional Core - IV)**

**Course Objectives:** The students shall apply the pharmacokinetic and pharmacodynamic principles in the design of CDDS. They also apply the design, evaluation and applications related to oral, parenteral, transdermal, implants, bioadhesives and targeted drug delivery systems.

**Course Outcomes:** Students will select the drugs for CDDS design of the formulation fabrication of systems of above drug delivery systems with relevant applications.

**UNIT - I**

Fundamentals of controlled drug delivery systems, pharmacokinetic and pharmacodynamic basis of controlled drug delivery. Design, fabrication, evaluation and applications of the following controlled releasing systems

- a. Controlled release oral drug delivery systems
- b. Parenteral controlled release drug delivery systems

**UNIT - II**

Design, fabrication, evaluation and applications of the following

- a. Implantable Therapeutic systems
- b. Transdermal delivery systems
- c. Ocular and Intrauterine delivery systems
- d. Vaccine delivery: Delivery systems used to promote uptake, absorption enhancers, oral immunization, controlled release microparticles form vaccine development

**UNIT - III**

Biochemical and molecular biology approaches to controlled drug delivery of

- a. Bioadhesive drug delivery systems
- b. Nasal drug delivery systems
- c. Drug delivery to Colon

**UNIT - IV**

Biochemical and molecular biology approaches to control drug delivery of

- a. Liposomes
- b. Niosomes
- c. Microspheres
- d. Nanoparticles
- e. Resealed erythrocytes

**UNIT - V**

Drug targeting to particular organs

- a. Delivery to lungs
- b. Delivery to the brain and problems involved
- c. Drug targeting in neoplasms

**TEXT BOOKS:**

1. Novel Drug Delivery System by Yie W. Chien.
2. Controlled Drug Delivery by Joseph R. Robinson and Vincent H. L. Lee.
3. Controlled and Novel Drug Delivery Systems by N. K. Jain.
4. Targeted and Controlled Drug Delivery (Novel carrier systems) by S. P. Vyas and Khar.

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.Pharm I Year I Sem (Pharmaceutics/Pharmaceutical Technology)**

**STABILITY OF DRUGS AND DOSAGE FORMS (Professional Elective - II)**

**Course Objectives:** These topics are designed impart a specialized knowledge to preserve the properties of drugs and dosage forms during manufacture storage and shelf life. The understanding of properties and evaluation of stability during storage, by solution and solid state against several factors of degradation.

**Course Outcomes:** The students should describe the evaluation of stability of solutions, solids and formulations against adverse conditions. The students should be able to suggest the measures to retain stability and storage conditions for retaining the efficacy of the products.

**UNIT - I**

**Drug decomposition mechanisms:**

1. Hydrolysis and acyltransfers: Nature of reaction, structure and utility, stabilization of Pharmaceutical examples.
2. Oxidation: Nature of oxidation, kinetics of oxidation, oxidation pathways of pharmaceutical, Interest Inhibition of oxidation
3. Photolysis: Energetics of photolysis, kinetics photolysis, photolytic reactions of pharmaceutical interest, prevention of photolytic reactions.

**UNIT - II**

Solid state chemical decomposition: Kinetic of solids state decomposition, Pharmaceutical examples of solid-state decomposition, Pure drugs, drug excipient and drug-drug interaction in solid state, methods of stabilization.

Physical stability testing of dosage forms:

1. Solids – tablets, capsules, powder and granules
2. Disperse systems
3. Microbial decomposition
4. Over-view, physical stability of novel drug carriers, liposomes, niosomes, nano-particles.

**UNIT - III**

Identification and quantitative determination of preservatives, Antioxidants, colouring materials, emulsifiers and stabilizers in Pharmaceutical formulation.

Analysis of drugs from biological samples including, selection of biological sample, extraction of drugs by various methods as LLE, SPE and Membrane filtration. Factors affecting extraction of drugs.

**UNIT - IV**

General method of analysis to determine the quality of raw materials used in cosmetic industry. Indian Standard Specifications (ISI) laid down for sampling and testing of various cosmetics in finished form by the Bureau of Indian Standards.

**UNIT - V**


Methods of analysis to determine the quality of cosmetics in the finished forms such as Hair care products, Skin care products, Baby care products, Dental products, Personal hygiene products, Colour cosmetics, Ethnic products, Colour makeup preparation, Lipsticks, Hair setting lotions and Eye shadows. Toxicity testing in cosmetics and Safety and Legislation of Cosmetic products.

Stability studies: Concept of stability studies.

- a) cGMP & ICH guidelines for Accelerated stability Testing.
- b) Interaction of containers & closure Compatibility Testing.

**REFERENCE BOOKS:**

1. Comprehensive Pharmacy Review 5th Edition by Leon Shargel, Alan H. Mutnick, Paul F. Souney, Larry N. Sawnsen – 2004.
2. A. H. Beckett and J. B. Stenlake Practical Pharmaceutical Chemistry, Part I and Part II, 4th Edition. 3. G. H. Jeffery, J. Basset, J. Mendham, R. C. Denny (Rev. by) Vogels Text Book of Quantitative Chemical Analysis, 5th Edition 1989, ELBS.
3. The Controller of Publications; New Delhi, Govt. of India, Indian Pharmacopoeia, Vol. I and Vol. II - 2010.
4. J. B. Wilkinson and R. J. Moore, Herry's Cosmeticology; Longman Scientific and Technical Publishers, Singapore.
5. P.D. Sethi; Quantitative Analysis of Drugs in Pharmaceutical Formulations, 3rd Edition - 1997,
6. Classification of cosmetics raw materials and adjuncts IS 3958 of Indian Standards Institution (BIS).
7. Cosmetic and toilet goods – methods of sampling IS 3958 of Indian Standards Institution (BIS).
8. Methods of sampling and test for various cosmetics as laid down by Bureau of Indian Standards.
9. Drug stability: Principles and practices by Jens T. Carstensen
10. Stability Testing of Drug Products by W. Grimm.
11. Stability of Drugs and Dosage Forms by Yoshioka and Stella.



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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.Pharm I Year I Sem (Pharmaceutical Analysis)**

**DRUG REGULATORY AFFAIRS (Professional Elective - I)**

**Course Objective:** The topics which are present in the Drug regulatory affairs are very much useful which increases the knowledge regarding the regulatory aspects in the pharmaceutical industries.

**Course Outcome:**

- Students will come to know the different competent regulatory authorities globally.
- Students be aware of technical aspects pertaining to the marketing authorization application (MAA)
- The regulatory guidelines and directions framed by the regulatory authorities will be helpful to place the drug products in market for marketing approvals.

**UNIT I**

**Drug Regulatory Aspects (India)**

1. Indian drug regulatory authorities, Central and State regulatory bodies (FDA)
2. Drugs and Cosmetics Act and Rules with latest Amendments (Selective)
3. Special emphasis – Schedule M and Y
4. New drugs – Importation, Registration, development, Clinical Trials, BE NOC & BE studies
5. Various Licences – Test Lic., Import lic., for testing of drugs and API's, Manufacturing Contract and Loan licence manufacturing.

**UNIT II**

**Good Manufacturing Practices (GMP)**

1. Indian GMP certification, WHO GMP certification.
2. ICH guidelines for stability testing and other relevant ones (Q1-Q10)
3. Export permissions and manufacturing for semi-regulated countries
4. Understanding of the plant layouts with special emphasis on the environment & safety (HVAC, Water Systems, Stores Management, Effluent etc.)
5. Quality Assurance and Quality Control – Basic understanding for in-built quality.

**UNIT III**

A detailed study of regulatory aspects that affect drug product design, manufacture and distribution in a developed country such as USA and in a developing country such as Brazil, Hatch Waxmann Act; Bolar Provisions and other FDA Regulations. Regulatory aspects of pharmaceutical and bulk drug manufacture, regulatory drug analysis.

**UNIT IV**

Documentation related to manufacturing, cleaning methods, retention samples and records, quality control, batch release documents, distribution records, complaints and recalls. Quality, safety and legislation for cosmetic products and herbal products.

**UNIT V**

**Governing Regulatory Bodies across the globe.**

- Country Authority Submission
- a. U.S Food & Drug Administration USDMF
  - b. Canada Therapeutic Product Directorate DMF
  - c. Europe
    - 1) European Medicines Agency (EMA/ National Authorities) EDMF
    - 2) European Directorate for Quality of Medicines CEP/COS & Health Care Products.

- 3) MHRA – Medicines and Health Care Products Regulatory Agency
- d. Product Filing
- e. Responding Regulatory Deficiencies
- f. Final Approval Procedure

Preparation, review and submission of Drug Master Files to Regulatory Authorities as per their specific requirements.

**TEXT AND REFERENCE BOOKS:**

1. Original laws published by Govt. of India.
2. Text Book of Forensic Pharmacy by Mithal B. M.; Vallabh Prakashan, New Delhi.
3. Laws of Drugs in India by Hussain.
4. Text Book of Forensic Pharmacy by Jain N. K.; Vallabh Prakashan, New Delhi.
5. Pharmaceutical Regulatory Affairs - Selected Topics, CVS Subramanyam and J Thimmasetty, Vallabh Prakashan Delhi - 2013



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**M.Pharm I Year I Sem (Pharmaceutical Analysis)**

**STABILITY OF DRUGS AND DOSAGE FORMS (Professional Elective – II)**

**Course Objective:** These topics are designed impart a specialized knowledge to preserve the properties of drugs and dosage forms during manufacture storage and shelf life. The understanding of properties and evaluation of stability during storage, by solution and solid state against several factors of degradation.

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2. Oxidation: Nature of oxidation, kinetics of oxidation, oxidation pathways of pharmaceutical, Interest Inhibition of oxidation
3. Photolysis: Energetics of photolysis, kinetics photolysis, photolytic reactions of pharmaceutical interest, prevention of photolytic reactions.

**UNIT - II**

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Physical stability testing of dosage forms:

1. Solids – tablets, capsules, powder and granules
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