



## ***1.3 Curriculum Enrichment***

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



**LIST OF ACTIVITIES ORGANISED BY THE COLLEGE TO  
ADDRESS VARIOUS CROSS CUTTING ISSUES DURING THE  
LAST FIVE YEARS(2017-2022)**

<b>S.NO</b>	<b>NAME OF THE ACTIVITY</b>	<b>CROSS CUTTING ISSUES INTEGRATED</b>
1	Nature camp	Environment and sustainability
2	National Deepostav	Environment and sustainability
3	Rangoli	Environment and sustainability
4	Haritha Haram	Environment and sustainability
5	Ganesh chaturdi	Environment and sustainability
6	Endemic bird day	Environment and sustainability
7	Swachha Bharath	Environment and sustainability
8	Bathukamma celebrations	Environment and sustainability
9	Yoga day	Gender Equity
10	Self defence	Gender Equity
11	Personality development programme	Gender Equity
12	National youth day	Gender Equity
13	Protection of Human Rights	Human values and professional ethics
14	National farmers day	Human values and professional ethics
15	National voters day	Human values and professional ethics
16	International womens day	Human values and professional ethics
17	Traditional day	Human values and professional ethics
18	Professional ethics and human values	Human values and professional ethics
19	Global campaign on kidney	Human values and professional ethics



# VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES

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Permitted by Govt. of T.S. & Approved by AICTE & P.C.I.

RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 10 .01.2017

## CIRCULAR

All the staff & students are hereby informed that to participate in "National Youth Day" initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.




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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email - vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	YUVA DIWAS	
Type of Activity	National youth day	
Date and time of activity	12 <sup>th</sup> Jan ,2017	10:00 am -1:00 pm
Details of Participants	346 Students	19 Faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	On the occasion of National Youth Day on 12 January 2017, Vikas college of pharmacy, Suryapet, organized an elaborate session on National Youth Day. The purpose of this session was to introduce students to the work of Swami Vivekananda, understand the importance of National Youth Day, and the challenges faced by the youth today.	
Photo		

(S. R.)  
CO-ORDINATOR

  
PRINCIPAL

VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 22.01.2017-

## CIRCULAR

All the staff & students are hereby informed that to participate in "NATIONAL GIRL CHILD DAY" on 24<sup>th</sup> January 2017, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.




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Permitted by Govt. of T.S. & Approved by AICTE & P.C.I.

RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikasouryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	NATIONAL GIRL CHILD DAY	
Type of Activity		
Date and Time of Activity	24 <sup>th</sup> January , 2018	10:00am-11:00pm
Details of Participants	308 Students	20 faculty
Coordinator(s)	N.shanthi	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>• vikas college of pharmacy conducted awareness program on national girl child day in Rayanigudem village a rally has been conducted</li><li>• The program aim towards promoting awareness about the rights of the girl child and to increase awareness on the importance of girl education, and their health and nutrition and also to promote the girls position in the society to make their living better among the society.</li></ul>	
Photo		

  
CO-ORDINATOR

  
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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 01.12.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in “Awareness Program on Pollution Day” on 2<sup>nd</sup> December 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.




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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	<b>National Pollution Day Celebrations</b>	
Type of Activity	Awareness Program on Pollution Day (India)	
Date and time of activity	2nd Dec, 2017	10:00 am -12:00 am
Details of Participants	211 Students	18 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>The NSS Volunteers of College and students has participated in the National Pollution Control Day which focused on preventing pollution and raising awareness about the ways we keep exploiting mother nature. This day is observed on 2nd December every year in remembrance of the people who passed away in the Bhopal Gas Tragedy, 1984. The industrial accident occurred in 1984 when the gas Methyl Isocyanate leaked on the night of December 2-3 and killed thousands.</p>	
Photo		

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapot@gmail.com.

Date: 20.03.2017

## CIRCULAR

All the staff & students are hereby informed that to participate in "WORLD WATER DAY" on 22<sup>nd</sup> March 2017, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email - vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	WORLD WATER DAY	
Type of Activity	focuses on the importance of freshwater	
Date and Time of Activity	22 <sup>nd</sup> march , 2018	10:00am-11:30am
Details of Participants	319 Students	15 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>• Vikas college of pharmacy conducted world water day program few important points were discussed</li><li>• The World Water Day has been observed since 1993 and intends to raise awareness of the 2.2 billion people living without access to safe water.</li><li>• These observances serve to reaffirm that water and sanitation measures are key to poverty reduction, economic growth, and environmental sustainability.</li></ul>	
Photo		

  
CO-ORDINATOR



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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 08.03.2017

## CIRCULAR

All the staff & students are hereby informed that to participate in “AWERNESS ON WORLD KIDNEY DAY” on 10th March 2017, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (MdI.&Dist.), TELANGANA STATE

Email: vikassuryapet@gmail.com

### ACTIVITY REPORT

Name of the Activity	GLOBAL COMPAGIN ON KIDNEY	
Type of Activity	World Kidney Day	
Date and Time of Activity	10 <sup>th</sup> march , 2018	10:00am-11:00am
Details of Participants	319Students	26faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>Awareness Programme on Kidney Health at Vikas College of pharmacy on 10<sup>th</sup> march 2017.The purpose of this programme was to give awareness on prevention of chronic kidney disease progression and available renal replacement therapies.</li></ul>	
Photo		

  
CO-ORDINATOR

  
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Rayanigudem (V)-508 376, Suryapet (MdI.)  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 16.03.2017

## CIRCULAR

All the staff & students are hereby informed that to participate in "INTERNATIONAL WOMEN'S DAY" on 18<sup>th</sup> March 2017, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE


Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	INTERNATIONAL WOMEN'S DAY	
Type of Activity	Raise a toast to the efforts of women	
Date and Time of Activity	8 <sup>th</sup> march , 2018	10:00am-1:00pm
Details of Participants	362 Students	22 Faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>The International Women's Day was celebrated at Vikas College of Pharmacy on 8<sup>TH</sup> March, 2017. The purpose of celebrating Women's Day is – To raise awareness about the status and dignity of women among the students.</li><li>At the beginning of program our respected chairman Dr. K. Ramdas, correspondent S. Srinivas Rao; Principal Dr. A. Ramesh gave a short speech on Women's day. Then some fun events were designed to make the boys realize the women's daily household work and of course to have fun for all.</li></ul>	
Photo		

  
CO-ORDINATOR

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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCE  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 20.03.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in "Nature Camp" on 20<sup>th</sup> March 2018 initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.




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Affiliated to Jawaharlal Nehru Technological University Hyderabad  
Permitted by Govt. of T.S. & Approved by AICTE & PCI

RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl & Dist.), TELANGANA STATE

Email: vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	NATURE CAMP	
Type of Activity	Forest visit	
Date and Time of Activity	21 <sup>st</sup> march , 2018	10:00 am -6:00 PM
Details of Participants	230 Students	25 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>Every year 21st of March is celebrated as World Forest Day; in this connection the NSS Unit has organized a Nature Camp at Arvapalli Forest, jangoan. The students have observed as the various biological diversities in both flora and fauna available in the forest. The aim of this program is to understand the role of individuals in the conservation of our forests and also to understand the impacts of the urbanization on various eco systems. The range officer of Arvapalli forest has explained the students about various species and the measures taken by the Forest department towards their conservation.</li></ul>	
Photo		

CO-ORDINATOR

PRINCIPAL  
VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V) - 508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 378, SURYAPET (MdI & Dist.), TELANGANA STATE

Email - vikassuryapet@gmail.com

Date: 07.03.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in "National Deepotsav" on 20<sup>th</sup> January 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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Rayanigudem (V)-508 378, Suryapet (MdI),  
Suryapet Dist, Telangana.



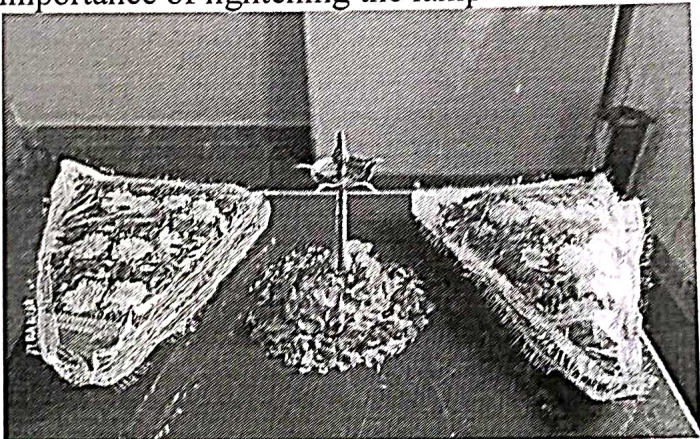
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	National Deepotsav	
Type of Activity	Program of Lighting Lamps	
Date and Time of Activity	20th January, 2019	10:00am-12:30am
Details of Participants	278 Students	24faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>VCPS NSS unit has organized Program of Lighting Lamps as a part of National Deepotsav on 20th January, 2019. The lamp lighting ceremony recognizes the student's entry into the engineering profession where the lamp symbolizes the light that an engineer becomes a designer in the respective engineering fields. In this regard, the faculties along with the students to ensure the importance of lightening the lamps.</p>	
Photos		

  
COORDINATOR

  
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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.),  
Suryapet Dist, Telangana.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapot@gmail.com.

Date: 14.07.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in “Awareness on natural colors (Rangoli)” on 16<sup>th</sup> July 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	<b>RANGOLI</b>	
Type of Activity	Awareness on Natural Colours	
Date and Time of Activity		3:00 pm-4:30pm
Details of Participants	278 Students	23 faculty
Coordinator(s)	N. Shanthi	
Organizing Dept./Support System	NSS Unit	
Description	Vikas college organizing awareness program on natural colours during this programme rangoli competition has been conducted. Students and staff are actively participated .prize are distributed for winners.	
photos		

  
COORDINATOR

  
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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
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Email : vikassuryapot@gmail.com.

Date: 14.07.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in “**Haritha Haram**” on 16<sup>th</sup> July 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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PRINCIPAL  
VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl. & Dist.), TELANGANA STATE

Email: vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	HARITHA HARRAM	
Type of Activity	Plantation Program	
Date and Time of Activity	16 <sup>th</sup> July, 2018	10:00 am -1:00 PM
Details of Participants	250 Students	22 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>The NSS Volunteers of College has participated in the Mega Plantation Program Organized by Vikas College of Pharmaceutical sciences at Suryapet on 16th July, 2018. The volunteers have planted more than 1200 plants at various open palaces nearby college.</li></ul>	
Photo		

  
CO-ORDINATOR

  
PRINCIPAL  
VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
RAYANIGUDEM (V), 508 376, Suryapet (Mdl.)  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 10.08.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in "Awareness Programme on Construction of Water Harvesting Pits" on 12<sup>th</sup> August 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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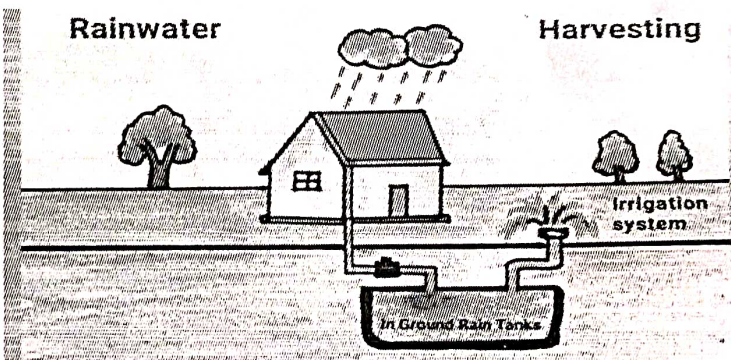
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	CONSTRUCTION OF WATER HARVESTING PITS	
Type of Activity	Rain water conservation	
Date and Time of Activity	12 <sup>th</sup> Aug, 2018	10:00 am -1:00 PM
Details of Participants	300 Students	17 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<ul style="list-style-type: none"><li>The NSS Volunteers has constructed 3 water harvesting pits at Rayangudum Village. This was completed with help of village youth and the rain water is diverted in to these pits. This is mainly to improve the ground water table.</li></ul>	
Photo		

  
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PRINCIPAL  
VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
Rayanigudem (V)-508 376, Suryapet (Mdl.&Dist.),  
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Email : vikassuryapet@gmail.com.

Date: 09.09.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in “FREE DISTRIBUTION OF CLAY GANESHA” on 11<sup>th</sup> September 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

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Email: vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	FREE DISTRIBUTION OF CLAY GANESHA	
Type of Activity	Environment protection	
Date and time of activity	11 <sup>th</sup> sep ,2018	10:00 am -1:00 PM
Details of Participants	267 Students	15 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	The NSS Volunteers had a stall of free clay Ganesh distribution at Suryapet. The students have created awareness on the use age of Clay Ganesh and harmful effects of Pop. The students have distributed nearly 255 clay ganesha to the public.	
Photo		

  
CO-ORDINATOR

  
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# VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES

Affiliated to Jawaharlal Nehru Technological University Hyderabad  
Permitted by Govt. of T.S. & Approved by AICTE & P.C.I.

RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 04.05.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in “**Awareness on Biodiversity on The Occasion of Endemic Bird Day**” on 5<sup>th</sup> May 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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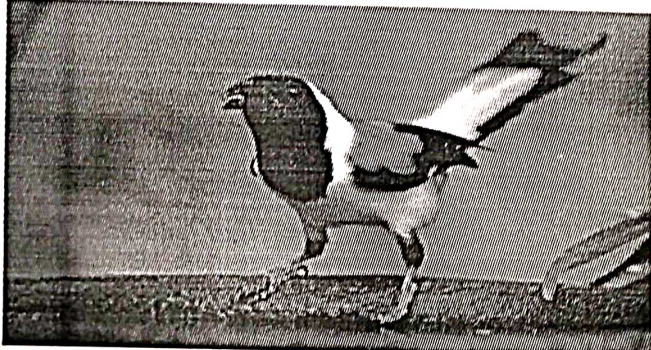
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	Endemic Bird Day	
Type of Activity	Awareness on Biodiversity	
Date and time of activity	5th May, 2018	10:00 am -1:00 PM
Details of Participants	262 Students	21 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	The NSS Volunteers and students of College has participated in the fourth edition of the Endemic Bird Day by going out to nearby forest area. Worldwide, this same day is marked as Global Big Day, which is a worldwide effort to document as many species as possible in a single 24- hour period.	
Photo		

  
CO-ORDINATOR

  
PRINCIPAL

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Rayanigudem (V)-508 376, Suryapet (Mdl.),  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 08.10.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in “Protection of Human Rights” on 10<sup>th</sup> October 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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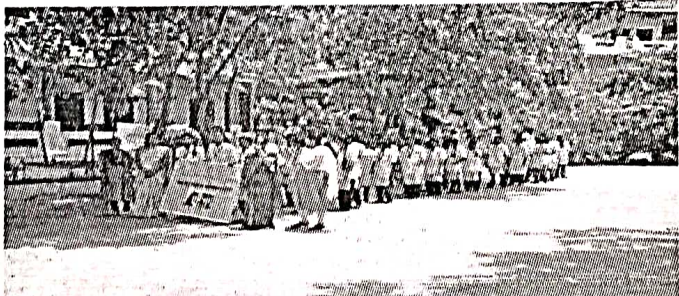
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email: vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	INDIGENOUS DAY	
Type of Activity	Protection of Human Rights	
Date and time of activity	10th Oct, 2017	10:00 am -12:00 am
Details of Participants	249 Students	18 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Photo	<p>The NSS Volunteers of College has participated in the Indigenous Day celebrations. The day is celebrated to spread awareness about the indigenous population around the world and to also protect their rights. In India, the indigenous population is also known as the Scheduled Tribes. Indigenous Peoples are distinct social and cultural groups that share collective ancestral ties to the lands and natural resources where they live, occupy or from which they have been displaced. There are between 370 and 500 million Indigenous Peoples worldwide, in over 90 countries.</p> 	

  
CO-ORDINATOR

  
PRINCIPAL

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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 30.09.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in "Swachha Bharath" on 1<sup>st</sup> October 2018, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	Swachha Bharath	
Type of Activity	Swachha Bharath	
Date and time of activity	1 <sup>st</sup> October 2018	10:00 am -1:00 pm
Details of Participants	309 Students	19 faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>The NSS Volunteers and students of College have participated in Swachha Bharath in the campus. The public icons &amp; celebrities were nominated as National Brand Ambassadors by Prime Minister Modi to join and support the Swachha Bharat Mission: Shilpa Settee (Actress), from February 2017. Raveena Tandon (Actress), from February 2017. Students have actively participated in the event and made grand success.</p>	
Photo		

  
CO-ORDINATOR

  
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RAYANGUDEM (V) - 508 376, SURYAPET (Mdl & Dist.), TELANGANA STATE

Email : vikasouryapet@gmail.com

Date: 10.10.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in "Universal Brotherhood Day" on 12<sup>th</sup> October 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapot@gmail.com

## ACTIVITY REPORT

Name of the Activity	Universal Brotherhood Day	
Type of Activity	Ek Bharat Vijayi Bharat	
Date and Time of Activity	12th October, 2019	10:00am-11:30am
Details of Participants	319 Students	25 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS NSS unit has organized an activity Ek Bharat Vijayi Bharat as a part of Universal Brotherhood Day on 12th October, 2019. The respective programme to focus on making people aware of the stipulating story of Vivekananda Rock Memorial and the activities of Vivekananda Kendra. In this programme, more than 319 students with 25 faculties were participated and got the proper awareness about the same.</p>	
Photos		

  
CO-ORDINATOR

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 10.08.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “**Awareness and Action for the Protection of Environment**” on 12th August 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

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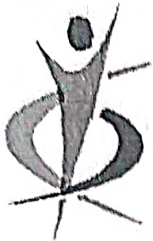
Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	<b>World Environmental Day Celebrations</b>	
Type of Activity	Awareness and Action for the Protection of Environment	
Date and Time of Activity	12 th August, 2019	11:00am-1:30pm
Details of Participants	312Students	25faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	VCPS NSS unit has organized a one day training program as part of World Environmental Day Celebrations on 02th August, 2019. In this connection they have invited all volunteers and corporate to participate in the awareness program .The main theme of this program is to motivation about the fragility of our environment and the importance of its protection. Faculties along with students have participated in the Cleaning of the sore of college campus on the same day from 11:00 am to 1.30 pm.	
Photo		

CO-ORDINATOR

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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 01.12.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “AWERNESS National Pollution Day” on 2<sup>nd</sup> December 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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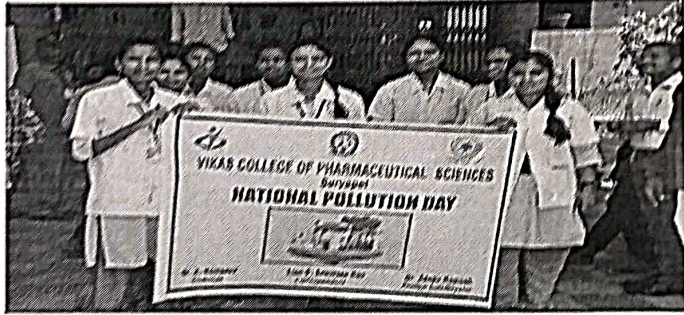
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	National Pollution Day	
Type of Activity	Pollution Awareness	
Date and Time of Activity	2 <sup>nd</sup> December, 2019	10:00am-11:30am
Details of Participants	319 Students	22 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS NSS unit has organized an activity program on Pollution Awareness as a part of National Pollution Day on 02th December, 2019. The main motive of this awareness program is to make people aware, expand the awareness in the industries that cause various pollutions like water, air, soil, noise and affect the environment and human health. In this program, more than 310 students with 22 faculties were participated and advice the people to follow the awareness about the same.</p>	
Photos		

  
CO-ORDINATOR

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 18.08.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in "World Photography Day" on 19<sup>th</sup> August 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	World Photography Day	
Type of Activity	Photography Dedicated to History	
Date and Time of Activity	19th August, 2019	10:00am-11:30am
Details of Participants	200 Students	25faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ Vcps NSS unit has organized an activity Photography Dedicated to History as a part of World Photography Day celebrations on 19th August, 2019. In this regard, it conducted photography completions for the faculties as well as the students in the college campus. All members to share the best photos in the completion and got the prizes for the attractive photos.</p>	
Photos		

CO-ORDINATOR

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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapot@gmail.com.

Date: 28.09.2019.

## CIRCULAR

All the staff & students are hereby informed that to participate in “BATHUKAMMA CELEBRATIONS” on 30<sup>th</sup> September 2019 initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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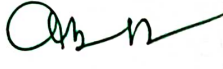
RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

## ACTIVITY REPORT

Name of the Activity	BATHUKAMMA CELEBRATIONS	
Type of Activity	Telangana festival	
Date and Time of Activity	30 <sup>TH</sup> SEP 2019	10:00 am -6:00 PM
Details of Participants	280 Students	25 faculty
Coordinator(s)	N.Shanthi	
Organizing Dept./Support System	NSS Unit	
Description	<p>Bathukamma celebration in vikas college of pharmaceutical sciences is organized by NSS unit. The chairman, correspondent, principal, were constitutive in encouraging the women staff and the girl students to participate in this Blithesome Ceremony. The 8 Departments of vcps have actively participated in the bathukamma decoration Competition followed by the Dance of the Gorgeously dressed women and girls for the resonating bathukamma Songs the Dances accentuated the festive mood symbolizing the zeal and undaunted spirit of vcps.</p>	
Photos		

  
CO-ORDINATOR

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 18.10.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “Awareness Program on Ozone Layer Depletion” on 19<sup>th</sup> October 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	International Ozone Layer Day	
Type of Activity	Awareness Program on Ozone Layer Depletion	
Date and Time of Activity	19th October, 2019	10:00am-11:30am
Details of Participants	267 Students	20 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS NSS unit has organized an activity Awareness Program on Ozone Layer Depletion as a part of International Ozone Layer Day on 19 th October, 2019. The respective programme to focus on making people aware of Ozone Layer Depletion and Raising awareness is the key to ensuring that industry and the public play an active role in meeting the challenges posed by ozone depletion in the world. In this programme, more than 267 students with 20 faculties were participated and got the proper awareness about the same.</p>	
Photos		

  
CO-ORDINATOR

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 11.01.2018

## CIRCULAR

All the staff & students are hereby informed that to participate in "National Farmers Day" on 23<sup>rd</sup> December 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	National Farmers Day	
Type of Activity	Awareness Program on Farmers growth	
Date and Time of Activity	23 <sup>rd</sup> December, 2019	10:00am-12:30am
Details of Participants	280 Students	24faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS on Awareness Program on Farmers growth as a part of National Farmers Day on 23th December, 2019. The main motive of this awareness program is to motivate the awareness among girls and boys on the importance of farmers and farming for a healthy and prosperous nation, and to encourage them to take up agriculture as a profession. In this program, more than 280 students with 24 faculties were participated and advice the people to follow the farmer awareness about the same.</p>	
Photos		

CO-ORDINATOR

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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapot@gmail.com.

Date: 24.01.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in "National Voters Day" on 25<sup>th</sup> January 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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Email : vikassuryapet@gmail.com.

## ACTIVITY REPORT

Name of the Activity	National Voters Day	
Type of Activity	Rally on Importance of Vote	
Date and Time of Activity	25 <sup>th</sup> January, 2019	10:00am-12:30am
Details of Participants	267 Students	24 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS on Awareness Program on Rally on Importance of Vote as a part of National Voters Day on 25th January, 2019. In order to encourage and motivate the man young voters to take part in the political environment and celebrate on January 25 every year as National Voters' Day. It focuses on the important role of the Younger to vote and form the stable government to the political of India. In this regard, the faculties along with the students to initiate the rally on the voting in the nearby place from college campus.</p>	
Photos		

  
CO-ORDINATOR

  
PRINCIPAL

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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 07.03.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “Awareness Program on Women Rights” on 8<sup>th</sup> March 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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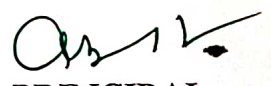
RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	International Women day	
Type of Activity	Awareness Program on Women Rights	
Date and Time of Activity	8 <sup>th</sup> march,2019	10:00am-12:30am
Details of Participants	310 Students	24faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS NSS unit has organized awareness program on women rights as a part of International Women day on 10th January, 2019. It focuses on empowering women and children in the basic and higher education, scholarships and job opportunities in all sectors. In this regard, the faculties along with then students to ensure the activities of cultural, political, and socioeconomic achievements of women.</p>	
Photos		

  
CO-ORDINATOR

  
PRINCIPAL  
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VIKAS COLLEGE OF PHARMACEUTICAL SCIENCES  
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Suryapet Dist, Telangana.



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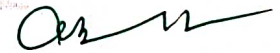
RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 04.05.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in "Endemic Bird Day" on 5<sup>th</sup> May 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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## ACTIVITY REPORT

Name of the Activity	Endemic Bird Day	
Type of Activity	Awareness on Biodiversity	
Date and time of activity	5 th May, 2019	10:00 am -1:00 PM
Details of Participants	278 Students	24faculty
Coordinator(s)	Punna Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	The NSS Volunteers and students of College has participated in the fourth edition of the Endemic Bird Day by going out to nearby forest area. Worldwide, this same day is marked as Global Big Day, which is a worldwide effort to document as many species as possible in a single 24- hour period.	
Photos		

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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 01.09.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in "Awareness & Demonstration Program to Celebrate "Eco-Friendly Ganesh" on 3<sup>rd</sup> September 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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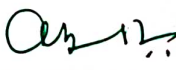
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	"Eco-friendly ganesha"	
Type of Activity	Awareness & demonstration program to celebrate "eco-friendly ganesha"	
Date and Time of Activity	Sep 3 <sup>rd</sup> 2019	3:00 pm-4:30pm
Details of Participants	350 Students	26 faculty
Coordinator(s)	N.shanthi	
Organizing Dept./Support System	NSS Unit	
Description	<p>Ganesh festival is a very important festival celebrated by many with festivity grandeur, fun, and colors. During this occasion as tradition demands, colorfully painted idols are brought home for this special occasion. But from this point of view of protecting nature since colors used to paint the idol would pollute the water on immersing the idol, and many aquatic creators. Hence, NSS team of vcps was organized to educate today's youth on the topic and to propagate the use of eco-friendly Ganesh idols. As part of this vcps organized a demonstration on eco-friendly ganesha.</p>	
photos		

  
CO-ORDINATOR

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com

Date: 02.12.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “Awareness on India’s Diverse Culture” on 4<sup>th</sup> December 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.



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## ACTIVITY REPORT

Name of the Activity	Traditional day	
Type of Activity	Awareness on India's diverse culture	
Date and Time of Activity	4 <sup>th</sup> Dec ,2019	3:00 pm-4:30pm
Details of Participants	362Students	24faculty
Coordinator(s)	N.shanthi	
Organizing Dept./Support System	NSS Unit	
Description	<p>Vikas college of pharmaceutical sciences organizing a traditional day program on the occasion of telugu new year ugadi. In this program students are actively participated. The Traditional Day was celebrated with great gusto and enthusiasm. The students came fully clad in their traditional dress. Their attire looked simply amazing as they collectively displayed an array of colors that reflected the diversity of India.</p>	
Photos		

  
CO-ORDINATOR



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Email : vikassuryapet@gmail.com.

Date: 04.09.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “**Women safety program**” on 6<sup>th</sup> September 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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Email : vikassuryapet@gmail.com

## ACTIVITY REPORT

Name of the Activity	<b>Women safety program</b>	
Type of Activity	Awareness program on women safety	
Date and Time of Activity	6 <sup>th</sup> sep ,2019	11:30am-1:30pm
Details of Participants	312Students	27faculty
Coordinator(s)	N. Shanthi	
Organizing Dept./Support System	NSS Unit	
Description	<p>On 06.09.2019 Women Safety and Crime Awareness Program was organized by NSS team of veps and dept of women development and child welfare department.. It was attended by some of the students of veps and Faculty members. It was meant for the basics of self-defense, for adolescent girls and women as part of its safety and awareness program.</p>	
Photo		

  
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RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE

Email : vikassuryapet@gmail.com.

Date: 28.08.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in “**HARITHA HARAM**” on 30<sup>th</sup> August 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

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## ACTIVITY REPORT

Name of the Activity	HARITHA HARAM	
Type of Activity	Go green	
Date and Time of Activity	30th August, 2019	10:00am-1:30pm
Details of Participants	346 Students	25 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>Vcps NSS unit has organized Go Green activity as a part of one day on 30th August, 2019. The main motive of this program is to maintain the environmental health, safety and sustainability by initiating go green activities. In this connection the faculties along with the students to initiate large scale tree-planting program (Haritha haram).</p>	
Photos		

  
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Email : vikassuryapot@gmail.com

Date: 03.10.2019

## CIRCULAR

All the staff & students are hereby informed that to participate in "Swachha Bharath" on 4<sup>th</sup> October 2019, initiated by vikas college of pharmaceutical sciences NSS unit. In these aspects, your requested participate in this program and make it success.

  
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Email : vikassuryapet@gmail.com.

## ACTIVITY REPORT

Name of the Activity	Swachha Bharath	
Type of Activity	Clean and Green	
Date and Time of Activity	04th October, 2019	10:00am-11:30am
Details of Participants	350 Students	25 faculty
Coordinator(s)	P.Venkateshwarlu	
Organizing Dept./Support System	NSS Unit	
Description	<p>➤ VCPS NSS unit has organized an activity Clean and Green as a part of Swachha Bharath on 04th October, 2019. It focuses on providing interventions for the safe management of solid and liquid waste in various places. In this regard, the faculties along with the students to initiate the activities of Swachha Bharath in the college campus. For this activity all members cleaned the campus play ground.</p>	
Photos		

  
CO-ORDINATOR

  
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**RAYANIGUDEM (V) - 508 376, SURYAPET (Mdl.&Dist.), TELANGANA STATE**

Email : [vikassuryapet@gmail.com](mailto:vikassuryapet@gmail.com)

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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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Email : [vikassuryapet@gmail.com](mailto:vikassuryapet@gmail.com)

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**APPENDIX-A**  
(See regulation 8)  
**PHARM.D. SYLLABUS**

**First Year**

**1.1 HUMAN ANATOMY & PHYSIOLOGY (THEORY)**

**Theory : 3 Hrs. /Week**

1. **Scope and Objectives:** This course is designed to impart a fundamental knowledge on the structure and functions of the human body. It also helps in understanding both homeostasis mechanisms and homeostatic imbalances of various body systems. Since a medicament, which is produced by pharmacist, is used to correct the deviations in human body, it enhances the understanding of how the drugs act on the various body systems in correcting the disease state of the organs.

2. **Upon completion of the course the student shall be able to:**

- a. describe the structure (gross and histology) and functions of various organs of the human body;
- b. describe the various homeostatic mechanisms and their imbalances of various systems;
- c. identify the various tissues and organs of the different systems of the human body;
- d. perform the hematological tests and also record blood pressure, heart rate, pulse and Respiratory volumes;
- e. appreciate coordinated working pattern of different organs of each system; and
- f. appreciate the interlinked mechanisms in the maintenance of normal functioning (homeostasis) of human body

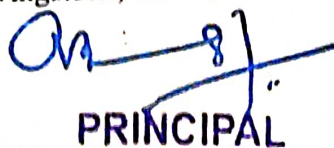
3. **Course materials:**

**Text books**

- a. Tortora Gerard J. and Nicholas, P. Principles of anatomy and physiology  
Publisher Harpercollins college New York.
- b. Wilson, K.J.W. Ross and Wilson's foundations of anatomy and physiology.  
Publisher: Churchill Livingstone, Edinburg.

**Reference books**

- a. Guyton arthur, C. *Physiology of human body*. Publisher: Holsaunders.
- b. Chatterjee, C.C. *Human physiology*. Volume 1&11. Publisher: medical allied agency, Calcutta.
- c. Peter L. Williams, Roger Warwick, Mary Dyson and Lawrence, H.
- d. *Gray's anatomy*. Publisher: Churchill Livingstone, London.



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#### 4. Lecture wise program :

##### Topics

- 1 Scope of anatomy and physiology, basic terminologies used in this subject  
(Description of the body as such planes and terminologies)
- 2 Structure of cell – its components and their functions.
- 3 Elementary tissues of the human body: epithelial, connective, Muscular and nervous tissues-their sub-types and characteristics
- 4 a) Osseous system - structure, composition and functions of the Skeleton. (done in practical classes - 6hrs)  
b) Classification of joints, Types of movements of joints and disorders of joints  
(Definitions only)
- 5 Haemopoetic System  
a) Composition and functions of blood  
b) Haemopoiesis and disorders of blood components (definition of disorder)  
c) Blood groups  
d) Clotting factors and mechanism  
e) Platelets and disorders of coagulation
- 6 Lymph  
a) Lymph and lymphatic system, composition, formation and circulation.  
b) Spleen: structure and functions, Disorders  
c) Disorders of lymphatic system (definition only)
- 7 Cardiovascular system  
a) Anatomy and functions of heart  
b) Blood vessels and circulation (Pulmonary, coronary and systemic circulation)  
c) Electrocardiogram (ECG)  
d) Cardiac cycle and heart sounds  
e) Blood pressure – its maintenance and regulation  
f) Definition of the following disorders  
Hypertension, Hypotension, Arteriosclerosis, Atherosclerosis, Angina,  
Myocardial infarction, Congestive heart failure, Cardiac arrhythmias
- 8 Respiratory system  
a) Anatomy of respiratory organs and functions  
b) Mechanism / physiology of respiration and regulation of respiration  
c) Transport of respiratory gases  
d) Respiratory volumes and capacities, and Definition of: Hypoxia, Asphyxia,  
Dybarism, Oxygen therapy and resuscitation.
- 9 Digestive system  
a) Anatomy and physiology of GIT  
b) Anatomy and functions of accessory glands of GIT  
c) Digestion and absorption  
d) Disorders of GIT (definitions only)

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- 10 Nervous system
- Definition and classification of nervous system
  - Anatomy, physiology and functional areas of cerebrum
  - Anatomy and physiology of cerebellum
  - Anatomy and physiology of mid brain
  - Thalamus, hypothalamus and Basal Ganglia
  - Spinal cord: Structure & reflexes – mono-poly-planter
  - Cranial nerves – names and functions
  - ANS – Anatomy & functions of sympathetic & parasympathetic N.S.
- 11 Urinary system
- Anatomy and physiology of urinary system
  - Formation of urine
  - Renin Angiotensin system – Juxtaglomerular apparatus - acid base Balance
  - Clearance tests and micturition
- 12 Endocrine system
- Pituitary gland
  - Adrenal gland
  - Thyroid and Parathyroid glands
  - Pancreas and gonads
- 13 Reproductive system
- Male and female reproductive system
  - Their hormones – Physiology of menstruation
  - Spermatogenesis & Oogenesis
  - Sex determination (genetic basis)
  - Pregnancy and maintenance and parturition
  - Contraceptive devices
- 14 Sense organs
- Eye
  - Ear
  - Skin
  - Tongue & Nose
- 15 Skeletal muscles
- Histology
  - Physiology of Muscle contraction
  - Physiological properties of skeletal muscle and their disorders (definitions)
- 16 Sports physiology
- Muscles in exercise, Effect of athletic training on muscles and muscle performance,
  - Respiration in exercise, CVS in exercise, Body heat in exercise, Body fluids and salts in exercise,
  - Drugs and athletics



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## 1.1 HUMAN ANATOMY & PHYSIOLOGY (PRACTICAL)

**Practical : 3 Hrs./Week**

**General Requirements:** Dissection box, Laboratory Napkin, muslin cloth, record, Observation book(100pages), Stationary items, Blood lancet.

**Course materials:**

**Text books**

Goyal, R. K, Natvar M.P, and Shah S.A, Practical anatomy, physiology and biochemistry, latest edition, Publisher: B.S Shah Prakashan, Ahmedabad.

**Reference books**

Ranade VG, Text book of practical physiology, Latest edition, Publisher: PVG, Pune  
Anderson Experimental Physiology, Latest edition, Publisher: NA

**List of Experiments:**

1. Study of tissues of human body
  - (a) Epithelial tissue.
  - (b) Muscular tissue.
2. Study of tissues of human body
  - (a) Connective tissue.
  - (b) Nervous tissue.
3. Study of appliances used in hematological experiments.
4. Determination of W.B.C. count of blood.
5. Determination of R.B.C. count of blood.
6. Determination of differential count of blood.
7. Determination of
  - (a) Erythrocyte Sedimentation Rate.
  - (b) Hemoglobin content of Blood.
  - (c) Bleeding time & Clotting time.
8. Determination of
  - (a) Blood Pressure.
  - (b) Blood group.
9. Study of various systems with the help of charts, models & specimens
  - (a) Skeleton system part I-axial skeleton.
  - (b) Skeleton system part II- appendicular skeleton.
  - (c) Cardiovascular system.
  - (d) Respiratory system.

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- (e) Digestive system.
- (f) Urinary system.
- (g) Nervous system.
- (h) Special senses.
- (i) Reproductive system.

10. Study of different family planning appliances.
11. To perform pregnancy diagnosis test.
12. Study of appliances used in experimental physiology.
13. To record simple muscle curve using gastrocnemius sciatic nerve preparation.
14. To record simple summation curve using gastrocnemius sciatic nerve preparation.
15. To record simple effect of temperature using gastrocnemius sciatic nerve preparation.
16. To record simple effect of load & after load using gastrocnemius sciatic nerve preparation.
17. To record simple fatigue curve using gastrocnemius sciatic nerve preparation.

**Scheme of Practical Examination:**

	Sessionals	Annual
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).



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### 1.3 MEDICINAL BIOCHEMISTRY (THEORY)

Theory : 3 Hrs. /Week

1. **Scope of the Subject:** Applied biochemistry deals with complete understanding of the molecular level of the chemical process associated with living cells. Clinical chemistry deals with the study of chemical aspects of human life in health and illness and the application of chemical laboratory methods to diagnosis, control of treatment, and prevention of diseases.

2. **Objectives of the Subject (Know, do, appreciate) :**

The objective of the present course is providing biochemical facts and the principles to the students of pharmacy. Upon completion of the subject student shall be able to –

- understand the catalytic activity of enzymes and importance of isoenzymes in diagnosis of diseases;
- know the metabolic process of biomolecules in health and illness (metabolic disorders);
- understand the genetic organization of mammalian genome; protein synthesis; replication; mutation and repair mechanism;
- know the biochemical principles of organ function tests of kidney, liver and endocrine gland; and
- do the qualitative analysis and determination of biomolecules in the body fluids.

**Text books (Theory)**

- Harpers review of biochemistry - Martin
- Text book of biochemistry – D.Satyanarayana
- Text book of clinical chemistry- Alex kaplan & Laverve L.Szabo

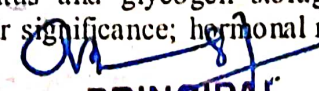
**Reference books (Theory)**

- Principles of biochemistry -- Lehninger
- Text book of biochemistry -- Ramarao
- Practical Biochemistry-David T.Plummer.
- Practical Biochemistry-Pattabhiraman.

3. **Lecture wise programme:**

**Topics**

- Introduction to biochemistry:** Cell and its biochemical organization, transport process across the cell membranes. Energy rich compounds; ATP, Cyclic AMP and their biological significance.
- Enzymes:** Definition; Nomenclature; IUB classification; Factor affecting enzyme activity; Enzyme action; enzyme inhibition. Isoenzymes and their therapeutic and diagnostic applications; Coenzymes and their biochemical role and deficiency diseases.
- Carbohydrate metabolism:** Glycolysis, Citric acid cycle (TCA cycle), HMP shunt, Glycogenolysis, gluconeogenesis, glycogenesis. Metabolic disorders of carbohydrate metabolism (diabetes mellitus and glycogen storage diseases); Glucose, Galactose tolerance test and their significance; hormonal regulation of carbohydrate metabolism.

  
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- 4 **Lipid metabolism:** Oxidation of saturated ( $\beta$ -oxidation); Ketogenesis and ketolysis; biosynthesis of fatty acids, lipids; metabolism of cholesterol; Hormonal regulation of lipid metabolism. Defective metabolism of lipids (Atherosclerosis, fatty liver, hypercholesterolemia).
- 5 **Biological oxidation:** Coenzyme system involved in Biological oxidation. Electron transport chain (its mechanism in energy capture; regulation and inhibition); Uncouplers of ETC; Oxidative phosphorylation;
- 6 **Protein and amino acid metabolism:** protein turn over; nitrogen balance; Catabolism of Amino acids (Transamination, deamination & decarboxylation). Urea cycle and its metabolic disorders; production of bile pigments; hyperbilirubinemia, porphoria, jaundice. Metabolic disorder of Amino acids.
- 7 **Nucleic acid metabolism:** Metabolism of purine and pyrimidine nucleotides; Protein synthesis; Genetic code; inhibition of protein synthesis; mutation and repair mechanism; DNA replication (semiconservative /onion peel models) and DNA repair mechanism.
- 8 **Introduction to clinical chemistry:** Cell; composition; malfunction; Roll of the clinical chemistry laboratory.
- 9 **The kidney function tests:** Role of kidney; Laboratory tests for normal function includes-
  - a) Urine analysis (macroscopic and physical examination, quantitative and semiquantitative tests.)
  - b) Test for NPN constituents. (Creatinine /urea clearance, determination of blood and urine creatinine, urea and uric acid)
  - c) Urine concentration test
  - d) Urinary tract calculi. (stones)
- 10 **Liver function tests:** Physiological role of liver, metabolic, storage, excretory, protective, circulatory functions and function in blood coagulation.
  - a) Test for hepatic dysfunction-Bile pigments metabolism.
  - b) Test for hepatic function test- Serum bilirubin, urine bilirubin, and urine urobilinogen.
  - c) Dye tests of excretory function.
  - d) Tests based upon abnormalities of serum proteins.
 Selected enzyme tests.
- 11 **Lipid profile tests:** Lipoproteins, composition, functions. Determination of serum lipids, total cholesterol, HDL cholesterol, LDL cholesterol and triglycerides.
- 12 **Immunochemical techniques** for determination of hormone levels and protein levels in serum for endocrine diseases and infectious diseases.  
Radio immuno assay (RIA) and Enzyme Linked Immuno Sorbent Assay (ELISA)
- 13 **Electrolytes:** Body water, compartments, water balance, and electrolyte distribution. Determination of sodium, calcium potassium, chlorides, bicarbonates in the body fluids.

  
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## 1.6 BIOLOGY (PRACTICAL)

**Practical : 3 Hrs./Week**

**Title:**

1. Introduction of biology experiments
2. Study of cell wall constituents and cell inclusions
3. Study of Stem modifications
4. Study of Root modifications
5. Study of Leaf modifications
6. Identification of Fruits and seeds
7. Preparation of Permanent slides
8. T.S. of Senna, Cassia, Ephedra, Podophyllum.
9. Simple plant physiological experiments
10. Identification of animals
11. Detailed study of Frog
12. Computer based tutorials

**Scheme of Practical Examination :**

	Sessionals	Annual
Identification	04	10
Synopsis	04	10
Major Experiment	07	20
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance.



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Second Year

Theory : 3 Hrs. /Week

1. **Scope of the Subject:** 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 of its application in other subject of pharmacy.
2. **Objectives of the Subject :** Upon completion of the subject student shall be able to –
  - a. describe the etiology and pathogenesis of the selected disease states;
  - b. name the signs and symptoms of the diseases; and
  - c. mention the complications of the diseases.

**Text books (Theory)**

- a. Pathologic basis of disease by- Cotran, Kumar, Robbins
- b. Text book of Pathology- Harsh Mohan
- c. Text book of Pathology- Y.M. Bhide

**Reference books (Theory)**

- a. Clinical Pharmacy and Therapeutics; Second edition by Walker; Churchill Livingstone publication

3. **Detailed syllabus and lecture wise schedule :**

**Chapter**

- 1 **Basic principles of cell injury and Adaptation**
  - a) Causes, Pathogenesis and morphology of cell injury
  - b) Abnormalities in lipoproteinaemia, glycogen infiltration and glycogen infiltration and glycogen storage diseases
- 2 **Inflammation**
  - a) Pathogenesis of acute inflammation, Chemical mediators in inflammation, Types of chronic inflammation
  - b) Repairs of wounds in the skin, factors influencing healing of wounds
- 3 **Diseases of Immunity**
  - a) Introduction to T and B cells
  - b) MHC proteins or transplantation antigens
  - c) Immune tolerance
    - Hypersensitivity  
Hypersensitivity type I, II, III, IV, Biological significance, Allergy due to food, chemicals and drugs
    - Autoimmunity  
Criteria for autoimmunity, Classifications of autoimmune diseases in man, mechanism of autoimmunity, Transplantation and immunologic tolerance, allograft rejections, transplantation antigens, mechanism of rejection of allograft.
    - Acquired immune deficiency syndrome (AIDS)

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- Amyloidosis

- 4 **Cancer:** differences between benign and malignant tumors, Histological diagnosis of malignancy, invasions and metastasis, patterns of spread, disturbances of growth of cells, classification of tumors, general biology of tumors, spread of malignant tumors, etiology and pathogenesis of cancer.
- 5 Types of shock, mechanisms, stages and management
- 6 Biological effects of radiation
- 7 Environmental and nutritional diseases
  - i) Air pollution and smoking- SO<sub>2</sub>, NO, NO<sub>2</sub>, and CO
  - ii) Protein calorie malnutrition, vitamins, obesity, pathogenesis of starvation.
- 8 Pathophysiology of common diseases
  - a. Parkinsonism
  - b. Schizophrenia
  - c. Depression and mania
  - d. Hypertension,
  - e. Stroke (ischaemic and hemorrhage)
  - f. Angina, CCF, Atherosclerosis, Myocardial infarction
  - g. Diabetes Mellitus
  - h. Peptic ulcer and inflammatory bowel diseases
  - i. Cirrhosis and Alcoholic liver diseases
  - j. Acute and chronic renal failure
  - k. Asthma and chronic obstructive airway diseases
- 9 Infectious diseases :  
Sexually transmitted diseases (HIV, Syphilis, Gonorrhoea), Urinary tract infections, Pneumonia, Typhoid, Tuberculosis, Leprosy, Malaria Dysentery (bacterial and amoebic ), Hepatitis- infective hepatitis.

4. Assignments :

**Title of the Experiment**

- 1 Chemical Mediators of inflammation
- 2 Drug Hypersensitivity
- 3 Cigarette smoking & its ill effects
- 4 Biological Effects of Radiation
- 5 Etiology and hazards of obesity
- 6 Complications of diabetes
- 7 Diagnosis of cancer
- 8 Disorders of vitamins
- 9 Methods in Pathology- Laboratory values of clinical significance
- 10 Pathophysiology of Dengue Hemorrhagic Fever (DHF)

**Format of the assignment**

- 1 Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year
4. It shall be computer draft copy.
5. Name and signature of the student
6. Time allocated for presentation may be 8+2 Min.



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## 2.2 PHARMACEUTICAL MICROBIOLOGY (THEORY)

Theory : 3 Hrs. /Week

1. **Scope of the Subject:** Microbiology has always been an essential component of pharmacy curriculum. This is because of the relevance of microbiology to pharmaceutical sciences and more specifically to pharmaceutical industry. Pharmaceutical biotechnology is the logical extension of pharmaceutical microbiology, which is expected to change the complete drug product scenario in the future.

This course deals with the various aspects of microorganisms, its classification, morphology, laboratory cultivation identification and maintenance. Its also discusses with sterilization of pharmaceutical products, equipment, media etc. The course further discusses the immunological preparations, diseases its transmission, diagnosis, control and immunological tests.

### 2. Objectives of the Subject :

Upon completion of the subject student shall be able to –

- know the anatomy, identification, growth factors and sterilization of microorganisms;
- know the mode of transmission of disease causing microorganism, symptoms of disease, and treatment aspect;
- do estimation of RNA and DNA and there by identifying the source;
- do cultivation and identification of the microorganisms in the laboratory;
- do identification of diseases by performing the diagnostic tests; and
- appreciate the behavior of motility and behavioral characteristics of microorganisms.

### Text books (Theory)

- Vanitha Kale and Kishor Bhusari “ Applied Microbiology ” Himalaya Publishing house Mumbai.
- Mary Louis Turgeon “ Immunology and Serology in Laboratory Medicines ” 2<sup>nd</sup> edition, 1996 Mosby- Year book inc St. Louis Missouri 63146.
- Harsh Mohan, “ Text book of Pathology ” 3<sup>rd</sup> edition, 1998, B-3 Ansari road Darya ganj N. Delhi.

### Reference books (Theory)

- Prescot L.M., Jarley G.P Klein D.A “Microbiology” 2<sup>nd</sup>- edition Mc Graw Hill Company Inc
- Rawlins E.A. ”Bentley’s Text Book of Pharmaceutics” B ailliere Tindals 24-28 London 1988
- Forbisher “ Fundamentals of Microbiology ” Philidelphia W.B. Saunders.
- Prescott L.M. Jarley G.P., Klein.D.A. “ Microbiology.” 2<sup>nd</sup> edition WMC Brown Publishers, Oxford. 1993
- War Roitt, Jonathan Brostoff, David male, “ Immunology ” 3<sup>rd</sup> edition 1996, Mosby-year book Europe Ltd, London.
- Pharmacopoeia of India, Govt of India, 1996.

  
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### 3. Detailed syllabus and lecture wise schedule :

#### Title of the topic

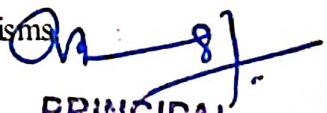
- 1 Introduction to the science of microbiology. Major divisions of microbial world and Relationship among them.
- 2 Different methods of classification of microbes and study of Bacteria, Fungi, virus, Rickettsiae, Spirochetes.
- 3 Nutritional requirements, growth and cultivation of bacteria and virus. Study of different important media required for the growth of aerobic and anaerobic bacteria & fungi. Differential media, enriched media and selective media, maintenance of lab cultures.
- 4 Different methods used in isolation and identification of bacteria with emphasis to different staining techniques and biochemical reactions. Counting of bacteria -Total and Viable counting techniques.
- 5 Detailed study of different methods of sterilization including their merits and demerits. Sterilization methods for all pharmaceutical products. Detailed study of sterility testing of different pharmaceutical preparations . Brief information on Validation.
- 6 Disinfectants- Study of disinfectants, antiseptics, fungicidal and virucidal agents factors affecting their activation and mechanism of action. Evaluation of bactericidal, bacteristatic, , virucidal activities, evaluation of preservatives in pharmaceutical preparations.
- 7 Immunology- Immunity, Definition, Classification, General principles of natural immunity, Phagocytosis, acquired immunity( active and passive ) . Antigens, chemical nature of antigens structure and formation of Antibodies, Antigen-Antibody reactions. Bacterial exotoxins and endotoxins. Significance of toxoids in active immunity, Immunization programme, and importance of booster dose.
- 8 Diagnostic tests : Schick's Test, Elisa test, Western Blot test, Southern Blot PCR Widal, QBC, Mantoux Peripheral smear. Study of malarial parasite.
- 9 Microbial culture sensitivity Testing: Interpretation of results Principles and methods of different microbiological assays, microbiological assay of Penicillin, Streptomycin and vitamin B<sub>2</sub> and B<sub>12</sub>. Standardisation of vaccines and sera.
- 10 Study of infectious diseases: Typhoid, Tuberculosis, Malaria, Cholera, Hepatitis, Meningitis, Syphilis & Gonorrhea and HIV.

### 2.2 PHARMACEUTICAL MICROBIOLOGY (PRACTICAL)

Practical : 3 Hrs./Week

#### Title of the Experiment:

- 1 Study of apparatus used in experimental microbiology\*.
- 2 Sterilisation of glass ware's. Preparation of media and sterilisation.\*
- 3 Staining techniques – Simple staining ; Gram's staining ; Negative staining\*\*
- 4 Study of motility characters\*.
- 5 Enumeration of micro-organisms (Total and Viable)\*
- 6 Study of the methods of isolation of pure culture.\*
- 7 Bio chemical testing for the identification of micro\*-organisms

  
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- 8 Cultural sensitivity testing for some micro-organisms.\*
  - 9 Sterility testing for powders and liquids.\*
  - 10 Determination of minimum inhibitory concentration.\*
  - 11 Microbiological assay of antibiotics by cup plate method.\*
  - 12 Microbiological assay of vitamins by Turbidometric method\*\*
  - 13 Determination of RWC.\*\*
  - 14 Diagnostic tests for some common diseases, Widal, malarial parasite.\*\*
- \* Indicate minor experiment & \*\* indicate major experiment

#### Assignments:

- 1 Visit to some pathological laboratories & study the activities and equipment/instruments used and reporting the same.
2. Visit to milk dairies (Pasturization) and microbial laboratories (other sterilization methods) & study the activities and equipment/instruments used and reporting the same.
3. Library assignments
  - a. Report of recent microbial techniques developed in diagnosing some common diseases.
  - b. Latest advancement developed in identifying, cultivating & handling of microorganisms.


#### Format of the assignment:

1. Minimum & Maximum number of pages.
2. It shall be computer draft copy.
3. Reference(s) shall be included at the end.
4. Name and signature of the student.
5. Assignment can be a combined presentation at the end of the academic year.
6. Time allocated for presentation may be 8+2 Min.

#### Scheme of Practical Examination:

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

  
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## 2.4 PHARMACOLOGY – I (THEORY)

**Theory : 3 Hrs. /Week**

1. **Scope of the Subject:** This subject will provide an opportunity for the student to learn about the drug with regard to classification, pharmacodynamic and pharmacokinetic aspects, adverse effects, uses, dose, route of administration, precautions, contraindications and interaction with other drugs. In this subject, apart from general pharmacology, drugs acting on autonomic nervous system, cardiovascular system, central nervous system, blood and blood forming agents and renal system will be taught. In addition to theoretical knowledge, the basic practical knowledge relevant to therapeutics will be imparted.
2. **Objectives of the Subject :** Upon completion of the subject student shall be able to (Know, do, appreciate) –
  - a. understand the pharmacological aspects of drugs falling under the above mentioned chapters;
  - b. handle and carry out the animal experiments;
  - c. appreciate the importance of pharmacology subject as a basis of therapeutics; and
  - d. correlate and apply the knowledge therapeutically.

**Text books (Theory)** (Author, Title, Edition, Publication Place, Publisher, Year of Publication)

- a. Tripathi, K. D. Essentials of medical pharmacology. 4<sup>th</sup> Ed, 1999. Publisher: Jaypee, Delhi.
- b. Satoskar, R.S. and Bhadarkar, S.D. Pharmacology and pharmacotherapeutics. 16<sup>th</sup> edition (single volume), 1999. Publisher: Popular, Dubai.
- c. Rang, H.P. & Dale, M.M. Pharmacology. 4<sup>th</sup> edition, 1999. Publisher: Churchill Living stone.

**Reference books (Theory)**(Author, Title, Edition, Publication Place, Publisher, Publication Year)

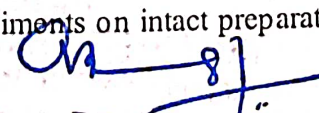
- a. Goodman Gilman, A., Rall, T.W., Nies, A.I.S. and Taylor, P. Goodman and Gilman's The pharmacological Basis of therapeutics. 9<sup>th</sup> Ed, 1996. Publisher Mc Graw Hill, Pergamon press.
- b. Craig, C.R.&Stitzel, R.E. Modern Pharmacology. Latest edition. Publisher: Little Brown.Co
- c. Katzung, B.G. Basic and clinical pharmacology. Latest edition. Publisher: Prentice Hall, Int.
- d. Shargel and Leon. Applied Biopharmaceutics and pharmacokinetics. Latest edition. Publisher: Prentice Hall, London.

**Text books (Practical) :**

Kulkarni, S. K. and Dandia, P. C. Hand book of experimental pharmacology. Latest edition, Publisher: Vallab, Delhi.

**Reference books (Practical)**

- a. Macleod, L.J. Pharmacological experiments on intact preparations. Latest edition, Publisher: Churchill livingstone.

  
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- b. Macleod, L.J. Pharmacological experiments on isolated preparations. Latest edition, Publisher: Churchill livingstone.
- c. Ghosh, M.N. Fundamentals of experimental pharmacology. Latest edition, Publisher: Scientific book agency, Kolkata.
- d. Ian Kitchen. Textbook of in vitro practical pharmacology. Latest edition, Publisher: Black well Scientific.

### 3. Detailed syllabus and lecture wise schedule :

#### Title of the topic

#### 1. General Pharmacology

- a) Introduction, definitions and scope of pharmacology
- b) Routes of administration of drugs
- c) Pharmacokinetics (absorption, distribution, metabolism and excretion)
- d) Pharmacodynamics
- e) Factors modifying drug effects
- f) Drug toxicity - Acute, sub- acute and chronic toxicity.
- g) Pre-clinical evaluations
- h) Drug interactions

*Note:* The term Pharmacology used here refers to the classification, mechanism of action, pharmacokinetics, pharmacodynamics, adverse effects, contraindications, Therapeutic uses, interactions and dose and route of administration.

#### 2. Pharmacology of drugs acting on ANS

- a) Adrenergic and antiadrenergic drugs
- b) Cholinergic and anticholinergic drugs
- c) Neuromuscular blockers
- d) Mydriatics and miotics
- e) Drugs used in myasthenia gravis
- f) Drugs used in Parkinsonism

#### 3. Pharmacology of drugs acting on cardiovascular system

- a) Antihypertensives
- b) Anti-anginal drugs
- c) Anti-arrhythmic drugs
- d) Drugs used for therapy of Congestive Heart Failure
- e) Drugs used for hyperlipidaemias



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## 2.5 COMMUNITY PHARMACY (THEORY)

Theory : 2 Hrs. /Week

1. **Scope:** In the changing scenario of pharmacy practice in India, Community Pharmacists are expected to offer various pharmaceutical care services. In order to meet this demand, students will be learning various skills such as dispensing of drugs, responding to minor ailments by providing suitable safe medication, patient counselling, health screening services for improved patient care in the community set up.
2. **Objectives:** Upon completion of the course, the student shall be able to –
  - a. know pharmaceutical care services;
  - b. know the business and professional practice management skills in community pharmacies;
  - c. do patient counselling & provide health screening services to public in community pharmacy;
  - d. respond to minor ailments and provide appropriate medication;
  - e. show empathy and sympathy to patients; and
  - f. appreciate the concept of Rational drug therapy.

### Text Books:

- a. Health Education and Community Pharmacy by N.S.Parmar.
- b. WHO consultative group report.
- c. Drug store & Business management by Mohammed Ali & Jyoti.

### Reference books:

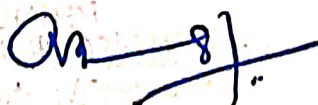
- a. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.
- b. Comprehensive Pharmacy Review – Edt. Leon Shargel. Lippincott Williams & Wilkins.

### Special requirements:

1. Either the college is having model community pharmacy (meeting the schedule N requirement) or sign MoU with at least 4-5 community pharmacies nearby to the college for training the students on dispensing and counselling activities.
2. Special equipments like B.P apparatus, Glucometer, Peak flow meter, and apparatus for cholesterol estimation.

### 3. Scheme of evaluation (80 Marks)

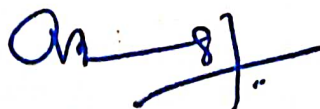
- |                                                                                                                                                                 |    |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----|
| 1. Synopsis                                                                                                                                                     | 10 |
| 2. Major Experiment<br>(Counselling of patients with specific diseases – emphasis should be given on Counselling introduction, content, process and conclusion) | 30 |
| 3. Minor Experiment (Ability to measure B.P/ CBG / Lung function)                                                                                               | 15 |
| 4. Prescription Analysis (Analyzing the prescriptions for probable drug interaction and ability to tell the management)                                         | 15 |
| 5. Viva – Voce                                                                                                                                                  | 10 |



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4. **Pharmacology of drugs acting on Central Nervous System**
  - a) General anesthetics
  - b) Sedatives and hypnotics
  - c) Anticonvulsants
  - d) Analgesic and anti-inflammatory agents
  - e) *Psychotropic drugs*
  - f) Alcohol and methyl alcohol
  - g) CNS stimulants and cognition enhancers
  - h) Pharmacology of local anaesthetics
  
5. **Pharmacology of Drugs acting on Respiratory tract**
  - a) Bronchodilators
  - b) Mucolytics
  - c) Expectorants
  - d) Antitussives
  - e) Nasal Decongestants
  
6. **Pharmacology of Hormones and Hormone antagonists**
  - a) Thyroid and Antithyroid drugs
  - b) Insulin, Insulin analogues and oral hypoglycemic agents
  - c) Sex hormones and oral contraceptives
  - d) Oxytocin and other stimulants and relaxants
  
7. **Pharmacology of autocooids and their antagonists**
  - a) Histamines and Antihistaminics
  - b) 5-Hydroxytryptamine and its antagonists
  - c) Lipid derived autocooids and platelet activating factor

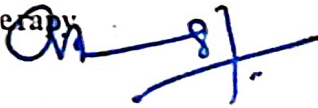


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#### 4. Lecture wise programme :

##### Topics

- 1 **Definition, scope, of community pharmacy**  
Roles and responsibilities of Community pharmacist
- 2 **Community Pharmacy Management**
  - a) Selection of site, Space layout, and design
  - b) Staff, Materials- coding stocking
  - c) Legal requirements
  - d) Maintenance of various registers
  - e) Use of Computers: Business and health care soft wares
- 3 **Prescriptions – parts of prescription, legality & identification of medication related problems like drug interactions.**
- 4 **Inventory control in community pharmacy**  
Definition, various methods of Inventory Control  
ABC, VED, EOQ, Lead time, safety stock
- 5 **Pharmaceutical care**  
Definition and Principles of Pharmaceutical care.
- 6 **Patient counselling**  
Definition, outcomes, various stages, barriers, Strategies to overcome barriers  
Patient information leaflets- content, design, & layouts, advisory labels
- 7 **Patient medication adherence**  
Definition, Factors affecting medication adherence, role of pharmacist in improving the adherence.
- 8 **Health screening services**  
Definition, importance, methods for screening  
Blood pressure/ blood sugar/ lung function and Cholesterol testing
- 9 **OTC Medication- Definition, OTC medication list & Counselling**
- 10 **Health Education**  
WHO Definition of health, and health promotion, care for children, pregnant & breast feeding women, and geriatric patients.  
Commonly occurring Communicable Diseases, causative agents,  
Clinical presentations and prevention of communicable diseases – Tuberculosis, Hepatitis, Typhoid, Amoebiasis, Malaria, Leprosy, Syphilis, Gonorrhea and AIDS  
Balance diet, and treatment & prevention of deficiency disorders  
Family planning – role of pharmacist
- 11 **Responding to symptoms of minor ailments**  
Relevant pathophysiology, common drug therapy to,  
Pain, GI disturbances (Nausea, Vomiting, Dyspepsia, diarrhea, constipation), Pyrexia, Ophthalmic symptoms, worms infestations.
- 12 **Essential Drugs concept and Rational Drug Therapy**  
Role of community pharmacist
- 13 **Code of ethics for community pharmacists**

  
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## 2.6 PHARMACOTHERAPEUTICS - I (THEORY)

Theory : 3 Hrs. /Week

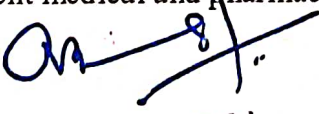
1. **Scope of the Subject:** This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.
2. **Objectives:** At completion of this subject it is expected that students will be able to understand –
  - a. the pathophysiology of selected disease states and the rationale for drug therapy;
  - b. the therapeutic approach to management of these diseases;
  - c. the controversies in drug therapy;
  - d. the importance of preparation of individualised therapeutic plans based on diagnosis;
  - e. needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects);
  - f. describe the pathophysiology of selected disease states and explain the rationale for drug therapy;
  - g. summarise the therapeutic approach to management of these diseases including reference to the latest available evidence;
  - h. discuss the controversies in drug therapy;
  - i. discuss the preparation of individualised therapeutic plans based on diagnosis; and
  - j. identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

### Text Books

- a. Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication.
- b. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange.

### Reference Books

- a. Pathologic basis of disease - Robins SL, W.B.Saunders publication.
- b. Pathology and therapeutics for Pharmacists: A Basis for Clinical Pharmacy Practice - Green and Harris, Chapman and Hall publication.
- c. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication.
- d. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA
- e. Avery's Drug Treatment, 4th Edn, 1997, Adis International Limited.
- f. Relevant review articles from recent medical and pharmaceutical literature.

  
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### 3. Detailed syllabus and lecture wise schedule :

Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases

Title of the topic

- 1 Cardiovascular system: Hypertension, Congestive cardiac failure, Angina Pectoris, Myocardial infarction, , Hyperlipidaemias , Electrophysiology of heart and Arrhythmias
- 2 Respiratory system : Introduction to Pulmonary function test, Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases  
Endocrine system : Diabetes, Thyroid diseases, Oral contraceptives, Hormone replacement therapy, Osteoporosis
- 3 General prescribing guidelines for
  - a. Paediatric patients
  - b. Geriatric patients
  - c. Pregnancy and breast feeding
- 4 Ophthalmology: Glaucoma, Conjunctivitis- viral & bacterial
- 5 Introduction to rational drug use  
Definition, Role of pharmacist Essential drug concept Rational drug formulations

### 2.6 PHARMACOTHERAPEUTICS - I (PRACTICAL)

Practical : 3 Hrs./Week

Practicals :

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation. A minimum of 20 cases should be presented and recorded covering most common diseases.

Assignments :

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.



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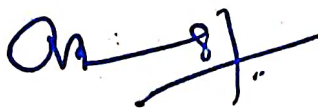
**Format of the assignment:**

1. Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year.
4. It shall be computer draft copy.
5. Name and signature of the student.
6. Time allocated for presentation may be 8+2 Min.

**Scheme of Practical Examination:**

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).



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## Third Year

### 3.1 PHARMACOLOGY – II (THEORY)

**Theory : 3 Hrs. /Week**

1. **Scope of the Subject:** This subject will provide an opportunity for the student to learn about the drug with regard to classification, pharmacodynamic and pharmacokinetic aspects, adverse effects, uses, dose, route of administration, precautions, contraindications and interaction with other drugs. In this subject, drugs acting on autacoids, respiratory system, GIT, immune system and hormones, and pharmacology of autacoids and hormones will be concentrated. In addition, pharmacology of chemotherapeutic agents, vitamins, essential minerals and principles of toxicology are also taught. In addition to theoretical knowledge, the basic practical knowledge relevant to therapeutics will be imparted.
2. **Objectives of the Subject Upon completion of the subject student shall be able to:**
  - a. understand the pharmacological aspects of drugs falling under the above mentioned chapters,
  - b. carry out the animal experiments confidently,
  - c. appreciate the importance of pharmacology subject as a basis of therapeutics, and
  - d. correlate and apply the knowledge therapeutically.

#### **Text books (Theory)**

- a. Tripathi, K. D. Essentials of medical pharmacology. 4<sup>th</sup> edition, 1999. Publisher: Jaypee, Delhi.
- b. Satoskar, R.S. and Bhadarkar, S.D. Pharmacology and pharmacotherapeutics. 16<sup>th</sup> edition (single volume), 1999. Publisher: Popular, Dubai.
- c. Rang, H.P. and Dale, M.M. Pharmacology. 4<sup>th</sup> edition, 1999. Publisher: Churchill Living stone.

#### **Reference books (Theory)**

- a. Goodman Gilman, A., Rall, T.W., Nies, A.I.S. and Taylor, P. Goodman and Gilman's The pharmacological Basis of therapeutics. 9<sup>th</sup> edition, 1996. Publisher: Mc Graw Hill, Pergamon press.
- b. Craig, C.R. and Stitzel, R.E. Modern Pharmacology. Latest edition. Publisher: Little Brown and company.
- c. Katzung, B.G. Basic and clinical pharmacology. Latest edition. Publisher: Prentice Hall, International.
- d. Gupta, P.K. and Salunkhe, D.K. Modern Toxicology. Volume I, II and III. Latest edition. Publisher: B.V. Gupta, Metropolitan Book Co. (p) Ltd, New Delhi.

#### **Text books (Practical)**

Kulkarni, S. K. and Dandia, P. C. Hand book of experimental pharmacology. Latest edition, Publisher: Vallab, Delhi.



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**Reference books (Practical) :**

- a. Macleod, L.J. Pharmacological experiments on intact preparations. Latest edition, Publisher: Churchill livingstone.
- b. Macleod, L.J. Pharmacological experiments on isolated preparations. Latest edition, Publisher: Churchill livingstone.
- c. Ghosh, M.N. Fundamentals of experimental pharmacology. Latest edition, Publisher: Scientific book agency, Kolkata.
- d. Ian Kitchen. Textbook of in vitro practical pharmacology. Latest edition, Publisher: Black well Scientific.

**3. Detailed syllabus and lecture wise schedule:****Title of the topic**

1. **Pharmacology of Drugs acting on Blood and blood forming agents**
  - a) Anticoagulants
  - b) Thrombolytics and antiplatelet agents
  - c) Haemopoietics and plasma expanders
2. **Pharmacology of drugs acting on Renal System**
  - a) Diuretics
  - b) Antidiuretics
3. **Chemotherapy**
  - a) Introduction
  - b) Sulfonamides and co-trimoxazole
  - c) Penicillins and Cephalosporins
  - d) Tetracyclins and Chloramphenicol
  - e) Macrolides, Aminoglycosides, Polyene & Polypeptide antibiotics
  - f) Quinolines and Fluroquinolines
  - g) Antifungal antibiotics
  - h) Antiviral agents
  - i) Chemotherapy of tuberculosis and leprosy
  - j) Chemotherapy of Malaria
  - k) Chemotherapy of protozoal infections (amoebiasis, Giardiasis)
  - l) Pharmacology of Anthelmintic drugs
  - m) Chemotherapy of cancer (Neoplasms)
4. **Immunopharmacology**  
Pharmacology of immunosuppressants and stimulants
5. **Principles of Animal toxicology**  
Acute, sub acute and chronic toxicity



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6. **The dynamic cell: The structures and functions of the components of the cell**

- a) Cell and macromolecules: Cellular classification, subcellular organelles, macromolecules, large macromolecular assemblies
- b) Chromosome structure: Pro and eukaryotic chromosome structures, chromatin structure, genome complexity, the flow of genetic information.
- c) DNA replication: General, bacterial and eukaryotic DNA replication.
- d) The cell cycle: Restriction point, cell cycle regulators and modifiers.
- e) Cell signaling: Communication between cells and their environment, ion-channels, signal transduction pathways (MAP kinase, P38 kinase, JNK, Ras and PI3-kinase pathways, biosensors.

**The Gene: Genome structure and function:**

- a) Gene structure: Organization and elucidation of genetic code.
- b) Gene expression: Expression systems (pro and eukaryotic), genetic elements that control gene expression (nucleosomes, histones, acetylation, HDACS, DNA binding protein families.
- c) Transcription and Transcription factors: Basic principles of transcription in pro and eukaryotes. Transcription factors that regulate transcription in pro and eukaryotes.

RNA processing: rRNA, tRNA and mRNA processing.

Protein synthesis: Mechanisms of protein synthesis, initiation in eukaryotes, translation control and post-translation events

Altered gene functions: Mutations, deletions, amplifications, LOH, traslocations, trinucleotide repeats and other genetic abnormalities.

Oncogenes and tumor suppressor genes.

The gene sequencing, mapping and cloning of human disease genes.

Introduction to gene therapy and targeting.

Recombinant DNA technology: principles. Processes (gene transfer technology) and applications

**Books:**

- 1 Molecular Biology of the Cell by Alberts B., Bray, D., Lewis, J., Raff M., Roberts, K and Watson, JD, 3<sup>rd</sup> edition.
- 2 Molecular Cell Biology By Lodish, H., Baltimore, D., Berk, A et al., 5<sup>th</sup> edition.
- 3 Molecular Biology by Turner, PC., McLennan, AG., Bates, AD and White MRH 2<sup>nd</sup> edition.
- 4 Genes VIII by Lewin, B., (2004)
- 5 Pharmaceutical Biotechnology, by Crommelin, DJA and Sindelar RD (1997)
- 6 Recombinant DNA by Watson, JD., Gilman, M., et al., (1996)
- 7 Biopharmaceutical: Biochemistry and Biotechnology by Walsh, G., (1998)

  
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### 3.1 PHARMACOLOGY – II (PRACTICAL)

Practical : 3 Hrs./Week

**List of Experiments:**

1. Study of laboratory animals and their handling (a. Frogs, b. Mice, c. Rats, d. Guinea pigs, e. Rabbits).
2. Study of physiological salt solutions used in experimental pharmacology.
3. Study of laboratory appliances used in experimental pharmacology.
4. Study of use of anesthetics in laboratory animals.
5. To record the dose response curve of Ach using isolated ileum/rectus abdominis muscle preparation.
6. To carry out bioassay of Ach using isolated ileum/rectus abdominis muscle preparation by interpolation method.
7. To carry out bioassay of Ach using isolated ileum/rectus abdominis muscle preparation by three point method.
8. To record the dose response curve of Histamine using isolated guinea-pig ileum preparation.
9. Study of agonistic and antagonistic effects of drugs using isolated guinea-pig ileum preparation.
10. To carry out bioassay of Histamine using isolated guinea-pig ileum preparation by interpolation method.
11. To carry out bioassay of Histamine using guinea-pig ileum preparation by three point method.
12. To study the routes of administration of drugs in animals (Rats, Mice, Rabbits).
13. Study of theory, principle, procedure involved and interpretation of given results for the following experiments:
  - a) Analgesic property of drug using analgesiometer.
  - b) Antiinflammatory effect of drugs using rat-paw edema method.
  - c) Anticonvulsant activity of drugs using maximal electroshock and pentylene tetrazole methods.
  - d) Antidepressant activity of drugs using pole climbing apparatus and pentobarbitone induced sleeping time methods.
  - e) Locomotor activity evaluation of drugs using actophotometer and rotorod.
  - f) Cardiotonic activity of drugs using isolated frog heart and mammalian heart preparations.

**Scheme of Practical Examination:**

	Sessionals	Annual
Identification	02	10
Synopsis	04	10
Major Experiment (Bioassay)	08	30
Minor Experiment (Interpretation of given Graph or simulated experiment)	04	10
Viva	02	10
Max Marks	20	70
Duration	3hrs	4hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

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### 3.3 PHARMACOTHERAPEUTICS – II (THEORY)

Theory : 3 Hrs. /Week

1. **Scope of the Subject:** This course is designed to impart knowledge and skills necessary for contribution to quality use of medicines. Chapters dealt cover briefly pathophysiology and mostly therapeutics of various diseases. This will enable the student to understand the pathophysiology of common diseases and their management.
2. **Objectives of the Subject Upon completion of the subject student shall be able to –**
  - a. know the pathophysiology of selected disease states and the rationale for drug therapy
  - b. know the therapeutic approach to management of these diseases;
  - c. know the controversies in drug therapy;
  - d. know the importance of preparation of individualised therapeutic plans based on diagnosis; and
  - e. appreciate the needs to identify the patient-specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time-course of clinical and laboratory indices of therapeutic response and adverse effects).

#### Text books (Theory)

Clinical Pharmacy and Therapeutics - Roger and Walker, Churchill Livingstone publication

#### Reference books (Theory)

- a. Pharmacotherapy: A Pathophysiologic approach - Joseph T. Dipiro et al. Appleton & Lange
- b. Clinical Pharmacy and Therapeutics - Eric T. Herfindal, Williams and Wilkins Publication
- c. Applied Therapeutics: The clinical Use of Drugs. Lloyd Young and Koda-Kimble MA]

#### 3. Detailed syllabus and lecture wise schedule :

**Etiopathogenesis and pharmacotherapy of diseases associated with following systems / diseases –**

##### Title of the topic

1. **Infectious disease:** Guidelines for the rational use of antibiotics and surgical Prophylaxis, Tuberculosis, Meningitis, Respiratory tract infections, Gastroenteritis, Endocarditis, Septicemia, Urinary tract infections, Protozoal infection- Malaria, HIV & Opportunistic infections, Fungal infections, Viral infections, Gonorrhoea and Syphilis
2. **Musculoskeletal disorders**  
Rheumatoid arthritis, Osteoarthritis, Gout, Spondylitis, Systemic lupus erythematosus.
3. **Renal system**  
Acute Renal Failure, Chronic Renal Failure, Renal Dialysis, Drug induced renal disorders

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- 4 **Oncology:** Basic principles of Cancer therapy, General introduction to cancer chemotherapeutic agents, Chemotherapy of breast cancer, leukemia. Management of chemotherapy nausea and emesis
- 5 **Dermatology:** Psoriasis, Scabies, Eczema, Impetigo

### 3.3 PHARMACOTHERAPEUTICS – II (PRACTICAL)

Practical : 3 Hrs./Week

#### Practicals :

Hospital postings in various departments designed to complement the lectures by providing practical clinical discussion; attending ward rounds; follow up the progress and changes made in drug therapy in allotted patients; case presentation upon discharge. Students are required to maintain a record of cases presented and the same should be submitted at the end of the course for evaluation.

The student shall be trained to understand the principle and practice involved in selection of drug therapy including clinical discussion.

A minimum of 20 cases should be presented and recorded covering most common diseases.

#### Assignments :

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

#### Format of the assignment :

1. Minimum & Maximum number of pages.
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year.
4. It shall be computer draft copy.
5. Name and signature of the student.
6. Time allocated for presentation may be 8+2 Min.

#### Scheme of Practical Examination :

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

  
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### 3.4 PHARMACEUTICAL JURISPRUDENCE (THEORY)

Theory : 2 Hrs. /Week

1. **Scope of the Subject** (4-6 lines): This course exposes the student to several important legislations related to the profession of pharmacy in India. The Drugs and Cosmetic Act, along with its amendments are the core of this course. Other acts, which are covered, include the Pharmacy Act, dangerous drugs, medicinal and toilet preparation Act etc. Besides this the new drug policy, professional ethics, DPCO, patent and design Act will be discussed.
2. **Objectives of the Subject**: Upon completion of the subject student shall be able to (Know, do, and appreciate) -
  - a. practice the Professional ethics;
  - b. understand the various concepts of the pharmaceutical legislation in India;
  - c. know the various parameters in the Drug and Cosmetic Act and rules;
  - d. know the Drug policy, DPCO, Patent and design act;
  - e. understand the labeling requirements and packaging guidelines for drugs and cosmetics;
  - f. be able to understand the concepts of Dangerous Drugs Act, Pharmacy Act and Excise duties Act; and
  - g. other laws as prescribed by the Pharmacy Council of India from time to time including International Laws.

#### Text books (Theory)

Mital, B M. Textbook of Forensic Pharmacy, Calcutta (National); 1988.

#### Reference books (Theory)

- a. Singh, KK, editor. Beotra's the Laws of Drugs, Medicines & cosmetics. Allahabad: Law Book House; 1984.
- b. Jain, NK. A Textbook of forensic pharmacy. Delhi: Vallabh prakashan ; 1995.
- c. Reports of the Pharmaceutical enquiry Committee
- d. I.D.M.A., Mumbai. DPCO 1995
- e. Various reports of Amendments.
- f. Deshapande, S.W. The drugs and magic remedies act 1954 and rules 1955. Mumbai: Susmit Publications; 1998.
- g. Eastern Book Company .The narcotic and psychotropic substances act 1985. Lucknow: Eastern; 1987.

### 3. Detailed syllabus and lecture wise schedule:

#### Title of the topic

1. **Pharmaceutical Legislations** - A brief review.
2. **Principle and Significance of professional ethics.** Critical study of the code of pharmaceutical ethics drafted by PCI.
3. **Drugs and Cosmetics Act, 1940, and its rules 1945.**  
 Objectives, Legal definition, Study of Schedule's with reference to Schedule B, C&C1, D, E1, F&F1, F2, F3, FF, G, H, J, K, M, N, P, R, V, W, X, Y.  
 Sales, Import, labeling and packaging of Drugs And Cosmetics  
 Provisions Relating to Indigenous Systems.  
 Constitution and Functions of DTAB, DCC, CDL.  
 Qualification and duties - Govt. analyst and Drugs Inspector.

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Practical : 3 Hrs./Week

**Practicals:**

Hospital postings for a period of at least 50 hours is required to understand the principles and practice involved in ward round participation and clinical discussion on selection of drug therapy. Students are required to maintain a record of 15 cases observed in the ward and the same should be submitted at the end of the course for evaluation. Each student should present at least two medical cases they have observed and followed in the wards.

**Etiopathogenesis and pharmacotherapy of diseases associated with following systems/ diseases:**

**Title of the topic**

- 1 **Gastrointestinal system:** Peptic ulcer disease, Gastro Esophageal Reflux Disease, Inflammatory bowel disease, Liver disorders - Alcoholic liver disease, Viral hepatitis including jaundice, and Drug induced liver disorders.
- 2 **Haematological system:** Anaemias, Venous thromboembolism, Drug induced blood disorders.
- 3 **Nervous system:** Epilepsy, Parkinsonism, Stroke, Alzheimer's disease,
- 4 **Psychiatry disorders:** Schizophrenia, Affective disorders, Anxiety disorders, Sleep disorders, Obsessive Compulsive disorders
- 5 **Pain management** including Pain pathways, neuralgias, headaches.
- 6 **Evidence Based Medicine**

**Assignments:**

Students are required to submit written assignments on the topics given to them. Topics allotted should cover recent developments in drug therapy of various diseases. A minimum of THREE assignments [1500 – 2000 words] should be submitted for evaluation.

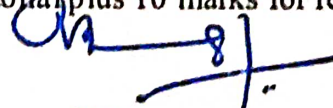
**Format of the assignment:**

1. Minimum & Maximum number of pages
2. Reference(s) shall be included at the end.
3. Assignment can be a combined presentation at the end of the academic year
4. It shall be computer draft copy
5. Name and signature of the student
6. Time allocated for presentation may be 8+2 Min.

**Scheme of Practical Examination :**

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessionals plus 10 marks for regularity, promptness, viva-voce and record maintenance).

  
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## 4.2 HOSPITAL PHARMACY (THEORY)

**Theory : 2 Hrs. /Week**

1. **Scope:** In the changing scenario of pharmacy practice in India, for successful practice of Hospital Pharmacy, the students are required to learn various skills like drug distribution, drug dispensing, manufacturing of parenteral preparations, drug information, patient counselling, and therapeutic drug monitoring for improved patient care.
2. **Objectives:** Upon completion of the course, the student shall be able to –
  - a. know various drug distribution methods;
  - b. know the professional practice management skills in hospital pharmacies;
  - c. provide unbiased drug information to the doctors;
  - d. know the manufacturing practices of various formulations in hospital set up;
  - e. appreciate the practice based research methods; and
  - f. appreciate the stores management and inventory control.

**Text books: (latest editions)**

- a. Hospital pharmacy by William .E. Hassan
- b. A text book of Hospital Pharmacy by S.H.Merchant & Dr. J.S. Qadry. Revised by R.K.Goyal & R.K. Parikh

**References:**

- a. WHO consultative group report.
- b. R.P.S. Vol.2. Part –B; Pharmacy Practice section.
- c. Handbook of pharmacy – health care. Edt. Robin J Harman. The Pharmaceutical press.

**3. Lecture wise programme :**

**Topics**

- 1 **Hospital - its Organisation and functions**
- 2 **Hospital pharmacy-Organisation and management**
  - a) Organizational structure-Staff, Infrastructure & work load statistics
  - b) Management of materials and finance
  - c) Roles & responsibilities of hospital pharmacist
- 3 **The Budget – Preparation and implementation**
- 4 **Hospital drug policy**
  - a) Pharmacy and Therapeutic committee (PTC)
  - b) Hospital formulary
  - c) Hospital committees
    - Infection committee
    - Research and ethical committee
  - d) developing therapeutic guidelines
  - e) Hospital pharmacy communication - Newsletter

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**5 Hospital pharmacy services**

- a) Procurement & warehousing of drugs and Pharmaceuticals
- b) Inventory control  
Definition, various methods of Inventory Control  
ABC, VED, EOQ, Lead time, safety stock
- c) Drug distribution in the hospital
  - i) Individual prescription method
  - ii) Floor stock method
  - iii) Unit dose drug distribution method
- d) Distribution of Narcotic and other controlled substances
- e) Central sterile supply services – Role of pharmacist

**6 Manufacture of Pharmaceutical preparations**

- a) Sterile formulations – large and small volume parenterals
- b) Manufacture of Ointments, Liquids, and creams
- c) Manufacturing of Tablets, granules, capsules, and powders
- d) Total parenteral nutrition

**7 Continuing professional development programs**

Education and training

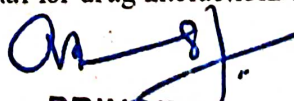
**8 Radio Pharmaceuticals – Handling and packaging****9 Professional Relations and practices of hospital pharmacist****4.2 HOSPITAL PHARMACY (PRACTICAL)**

**Practical : 3 Hrs./Week**

1. Assessment of drug interactions in the given prescriptions
2. Manufacture of parenteral formulations, powders.
3. Drug information queries.
4. Inventory control

**List of Assignments:**

1. Design and Management of Hospital pharmacy department for a 300 bedded hospital.
2. Pharmacy and Therapeutics committee – Organization, functions, and limitations.
3. Development of a hospital formulary for 300 bedded teaching hospital
4. Preparation of ABC analysis of drugs sold in one month from the pharmacy.
5. Different phases of clinical trials with elements to be evaluated.
6. Various sources of drug information and systematic approach to provide unbiased drug information.
7. Evaluation of prescriptions generated in hospital for drug interactions and find out the suitable management.



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**Special requirements:**

1. Each college should sign MoU with nearby local hospital having minimum 150 beds for providing necessary training to the students' on hospital pharmacy activities.
2. Well equipped with various resources of drug information.

**Scheme of Practical Examination:**

	Sessionals	Annual
Synopsis	05	15
Major Experiment	10	25
Minor Experiment	03	15
Viva	02	15
Max Marks	20	70
Duration	03hrs	04hrs

Note : Total sessional marks is 30 (20 for practical sessional plus 10 marks for regularity, promptness, viva-voce and record maintenance).

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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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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

##### Blomolecules

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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## 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, alcaptonuria, 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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#### UNIT – IV 05 Hours

##### Plants and mineral nutrition:

Essential mineral, macro and micronutrients, Nitrogen metabolism, Nitrogen cycle, biological nitrogen fixation

##### Photosynthesis:

Autotrophic nutrition, photosynthesis, Photosynthetic pigments, Factors affecting photosynthesis.

#### UNIT – V 04 Hours

**Plant respiration:** Respiration, glycolysis, fermentation (anaerobic).

##### Plant growth and development

Phases and rate of plant growth, Condition of growth, Introduction to plant growth regulators

##### Cell - The unit of life

Structure and functions of cell and cell organelles. Cell division

##### Tissues

Definition, types of tissues, location and functions.

#### TEXT BOOKS:

1. Text book of Biology by S. B. Gokhale
2. A Text book of Biology by Dr. Thulajappa and Dr. Seetaram.

#### REFERENCE BOOKS:

1. Text book of Biology by B. V. Sreenivasa Naidu
2. A Text book of Biology by Naidu and Murthy
3. Botany for Degree students By A.C.Dutta.
4. Outlines of Zoology by M. Ekambaranatha ayyer and T. N. Anantha krishnan.
5. A manual for pharmaceutical biology practical by S. B. Gokhale and C. K. Kokate



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## PS201: HUMAN ANATOMY AND PHYSIOLOGY- II

B. Pharm. I Year II Sem

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**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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### Urinary system

Anatomy of urinary tract with special reference to anatomy of kidney and nephrons, functions of kidney and urinary tract, physiology of urine formation, micturition reflex and role of kidneys in acid base balance, role of RAS in kidney and disorders of kidney.

### Unit – V 09 hours

#### Reproductive system

Anatomy of male and female reproductive system, Functions of male and female reproductive system, sex hormones, physiology of menstruation, fertilization, spermatogenesis, oogenesis, pregnancy and parturition

#### Introduction to genetics

Chromosomes, genes and DNA, protein synthesis, genetic pattern of inheritance

#### 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, Riverview, 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 brothers medical publishers, New Delhi.
7. Textbook of Practical Physiology by C.L. Ghai, Jaypee brothers 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:

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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## 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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## PC404: PHARMACOLOGY - I

B. Pharm. II Year II Sem

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**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.

10 Hours

### UNIT-III

#### 2. Pharmacology of peripheral nervous system

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

10 Hours

### UNIT-IV

#### 3. Pharmacology of central nervous system

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

7 Hours

### UNIT-V

#### Pharmacology of central nervous system 07 Hours

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

#### Recommended Books (Latest Editions)

- Rang H. P., Dale M. M., Ritter J. M., Flower R. J., Rang and Dale's Pharmacology, Churchill Livingstone Elsevier
- Katzung B. G., Masters S. B., Trevor A. J., Basic and clinical pharmacology, Tata Mc Graw-Hill
- Goodman and Gilman's, The Pharmacological Basis of Therapeutics
- 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
- Mycek M.J, Gelnet S.B and Perper M.M. Lippincott's Illustrated Reviews-Pharmacology
- K.D.Tripathi. Essentials of Medical Pharmacology, JAYPEE Brothers Medical Publishers (P) Ltd, New Delhi.
- Sharma H. L., Sharma K. K., Principles of Pharmacology, Paras medical publisher
- Modern Pharmacology with clinical Applications, by Charles R. Craig & Robert.
- Ghosh MN. Fundamentals of Experimental Pharmacology. Hilton & Company, Kolkata.
- Kulkarni SK. Handbook of experimental pharmacology. Varad Prakashan

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

**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.

10 hours

**UNIT - I****1. Pharmacology of drugs acting on Respiratory system**

- a. Anti -asthmatic drugs
- b. Drugs used in the management of COPD
- c. Expectorants and antitussives
- d. Nasal decongestants
- e. Respiratory stimulants

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

- a. Antiulcer agents.
- b. Drugs for constipation and diarrhoea.
- c. Appetite stimulants and suppressants.
- d. Digestants and carminatives.
- e. Emetics and anti-emetics.

10 hours

**UNIT – II****Chemotherapy**

- a. General principles of chemotherapy.
- b. Sulfonamides and cotrimoxazole.
- c. Antibiotics - Penicillins, cephalosporins, chloramphenicol, macrolides, quinolones and fluoroquinolones, tetracycline and aminoglycosides

**UNIT – III****Chemotherapy**

- a. Antitubercular agents
- b. Antileprotic agents
- c. Antifungal agents
- d. Antiviral drugs
- e. Anthelmintics
- f. Antimalarial drugs
- g. Antiamoebic agents

10 hours

**UNIT – IV****1. Chemotherapy**

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

08 hours

## 2. Immunopharmacology

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

07 hours

## UNIT – V

### 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, 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 Modern
8. 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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## PS802: SOCIAL AND PREVENTIVE PHARMACY

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B.Pharm. IV Year II Sem.

**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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**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**

- a. Biological and metabolic factors affecting bioavailability, complexation, dissolution - techniques of enhancing dissolution.
- b. Formulation factors affecting bioavailability of drugs in dosage forms of tablets, capsules, parenterals, liquid orals and topical dosage forms.
- c. **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.
- d. **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:

- a. Distribution: Apparent volume of distribution and its determination, factors affecting.
- b. Metabolism: Metabolic rate constant, Factors affecting Metabolism
- c. Elimination: Over all apparent elimination rate constant, and half life.  
All the above under the following conditions:
  1. Intravenous infusion
  2. Multiple dose injections
- d. Non-invasive methods of estimating pharmacokinetics parameters with emphasis on salivary and urinary samples.
- e. 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 Niazi Sarfaraz

#### 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.

5. Modern Pharmaceutics by Gilbert S. Banker and Christopher T. Rhodes.
6. Advances in Drug Delivery, Vol 1, 2, 3 by Y. Madhusudan Rao, A.V. Jithan
7. Oral Drug Delivery Technology, 2<sup>nd</sup> ed, by Aukunuru Jithan

  
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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**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.

**Course Outcome:** 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. Sawanson – 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. 12. Stability of Drugs and Dosage Forms by Yoshioka and Stella.



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

**PHARMACEUTICAL PROCESS CHEMISTRY (Professional Elective – III)**

**Course Objectives:** The goal of a process chemist is to develop synthetic routes that are safe, cost-effective, environmentally friendly, and efficient. The subject is designed to impart knowledge on the development and optimization of a synthetic route/s and the pilot plant procedure for the manufacture of Active Pharmaceutical Ingredients (APIs) and new chemical entities (NCEs) for the drug development phase.

**Course Outcome:** At completion of this course it is expected that students will be able to understand

- The strategies of scale up process of APIs and intermediates
- The various unit operations and various reactions in process chemistry

**UNIT - I**

Process chemistry; Introduction, Synthetic strategy Stages of scale up process: Bench, pilot and large-scale process. In-process control and validation of large-scale process. Case studies of some scale up process of APIs. Impurities in API, types and their sources including genotoxic impurities

**UNIT - II**

**Unit operations**

- a) Extraction: Liquid equilibria, extraction with reflux, extraction with agitation, counter current extraction.
- b) Filtration: Theory of filtration, pressure and vacuum filtration, centrifugal filtration.
- c) Distillation: azeotropic and steam distillation
- d) Evaporation: Types of evaporators, factors affecting evaporation.
- e) Crystallization: Crystallization from aqueous, nonaqueous solutions factors affecting crystallization, nucleation. Principle and general methods of Preparation of polymorphs, hydrates, solvates and amorphous APIs.

**UNIT - III**

**Unit Processes - I**

- a) Nitration: Nitrating agents, Aromatic nitration, kinetics and mechanism of aromatic nitration, process equipment for technical nitration, mixed acid for nitration.
- b) Halogenation: Kinetics of halogenations, types of halogenations, catalytic halogenations. Case study on industrial halogenation process.
- c) Oxidation: Introduction, types of oxidative reactions, Liquid phase oxidation with oxidizing agents. Nonmetallic Oxidizing agents such as H<sub>2</sub>O<sub>2</sub>, sodium hypochlorite, Oxygen gas, ozonolysis.

**UNIT - IV**

**Unit Processes - II**

- a) Reduction: Catalytic hydrogenation, Heterogeneous and homogeneous catalyst; Hydrogen transfer reactions, Metal hydrides. Case study on industrial reduction process.
- b) Fermentation: Aerobic and anaerobic fermentation.

**Production of**

- i. Antibiotics; Penicillin and Streptomycin,
- ii. Vitamins: B<sub>2</sub> and B<sub>12</sub>
- iii. Statins: Lovastatin, Simvastatin

**c) Reaction progress kinetic analysis**

- i. Streamlining reaction steps, route selection,

## R19 M.PHARM PHARMACEUTICAL CHEMISTRY

5. Ariens, Drug Design, Academic Press
6. Purcell Strategies of Drug Design
7. Corwin, Hansen Comprehensive Medicinal Chemistry
8. Richard B. Silvermann, Org. Chemistry of Drug Design and drug Action
9. Smith and Williams, Introduction to principles of Drug Design – Harwood Academy Press
10. Gyorgy Keri & Istvan Toth Molecular Pathomechanism and New Trends in Drug Research, Taylor & Francis Pub
11. Thomas Nogrady, Medicinal Chemistry. A biochemical Approach, Oxford Univ. Press.



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JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD  
M.Pharm I Year II Sem (Pharmaceutical Chemistry)

ADVANCED MEDICINAL CHEMISTRY – II (Professional Core – IV)

**Course Objective:** The course contents of Unit I and Unit II are mainly aimed at enzyme inhibitors for the treatment of different CNS and CVS diseases. Unit III contents are aimed to have advanced knowledge of the developments of antipsychotic agents. The remaining contents are aimed to design prodrugs, peptidomimetic agents and recombinant DNA products.

**Course Outcome:** The student would be in a position to involve in the development of different enzyme inhibitors, prodrugs and also equipped with different biotechnological techniques of recombinant DNA products.

**UNIT - I**

**Enzyme Inhibitors I:** A detailed study of the following types of enzyme inhibitors, related drugs and their pharmaceutical significance:

- a) Prostaglandin Synthetase (Cyclooxygenase & Lipoxygenase Inhibitors)
- b) Phosphodiesterase (PDE) Inhibitors
- c) Carbonic Anhydrase Inhibitors.
- d) B- Secretase.

**UNIT - II**

**Enzyme Inhibitors II:**

- a) Angiotensin Converting Enzyme (ACE) Inhibitors
- b) Acetyl Cholinesterase (Ach E) Inhibitors.
- c) HMG-CoA inhibitors
- d) Protease inhibitors

**UNIT - III**

**Antipsychotic Agents:** Role of Dopamine, Serotonin, Glutamate and their receptors. SAR and Pharmacokinetics of Ticyclic Neuroleptics, Butyrophenones and Benzamides. A brief account of non – benzodiazepine agonist.

**UNIT - IV**

**Peptidmimetic agents & Prodrugs**

- a) Physiological role of peptids, Endogenous peptide transmitters & function, cyclosporin and oxytocin
- b) Prodrugs belong to esters, Lactones, amides, hydrazides and azo compounds. Targettedprodrug, bioprecursor of prodrugs

**UNIT - V**

**Biotechnologically produced drugs:** Biotechnology of Recombinant DNA, Process of Recombinant proteins, Immunogenicity of biotechnologically produced drugs.

**Recombinant drug products:** Hormones, cytokinins, interferons, Interleukins, enzymes, vaccines and monoclonal antibody drugs.

**RECOMMENDED BOOKS:**

1. Berger's Medicinal Chemistry and Drug Design. 6<sup>th</sup> Edition
2. Korolkovas Essentials of Medicinal Chemistry
3. William O Foye Medicinal Chemistry
4. Lednicer, Organic Chemistry of Drug Synthesis

- c. Segment and sequential strategies for solution phase peptide synthesis with any two case studies
- d. Side reactions in peptide synthesis: Deletion peptides, side reactions initiated by proton abstraction, protonation, overactivation and side reactions of individual amino acids.

#### UNIT - V

**Combinatorial Chemistry:** Introduction, solid phase techniques, parallel synthesis, mixed combinatorial chemistry, deconvolution techniques, tagging, photolithography, limitations of combinatorial chemistry, planning and designing of combinatorial synthesis.

#### RECOMMENDED BOOKS:

1. W. Carruthers, Some Modern Methods of Org. Synthesis, III rd Edition, Cambridge University Press, Cambridge (1988)
2. Gorgy Keri and Istarian Toth, Molecular Patho-mechanisms and New Trends in Drug Research – Taylor and Francis Group, London 2003
3. R. K. Mackie, A Guidebook to Organic Thesis – Prentice Hall
4. T.W. Greene and PGM Warts, Protecting Groups – John Willey
5. Michael B. Smith, Organic Synthesis
6. Organic synthesis- Special techniques VK Ahluwalia and R Aggarwal, Narosa Publishers.
7. "Organic Chemistry" Vol I and II. I.L. Finar. ELBS, Sixth ed., 1995.
8. "Advanced Organic chemistry, Reaction, mechanisms and structure", J March, John Wiley and sons, New York.
9. Principles of organic synthesis, ROC Norman and JM Coxan, Nelson thorns
10. Carey, Organic chemistry, 5th edition (Viva Books Pvt. Ltd.)

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R19 M.PHARM I SEM

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

**PHARMACOKINETICS AND DRUG METABOLISM (Professional Elective - I)**

**Course Objective:** In current methods of treatment which involves individualization of drug therapy, the student should have sound knowledge in pharmacokinetics and the effects of changes in pharmacokinetic parameters on therapeutic efficacy of the drugs.

**Course Outcomes:** Upon completion of the subject student shall be able to (Know, do, appreciate);

- Understand various pharmacokinetic parameters
- Influence of these parameters on efficacy of drugs
- Identify and resolve drug related problems;
- Pharmacogenetics

**UNIT - I**

**Drug Absorption:** Gastrointestinal, percutaneous, and rectal kinetics and factors affecting drug absorption. Absorption kinetics

**UNIT - II**

**Drug Distribution:** Plasma protein binding – factors affecting plasma protein binding – Tissue binding – transfer of drugs through biological barriers their therapeutic implication in drug action. Volume of distribution. Reaction of the body to foreign substances: Biotransformation of drugs, phase I and phase II metabolic reactions.

**UNIT - III**

**Elimination of drugs:** Concept of renal clearance and excretion of drugs –biological half – life, area under curve.

**UNIT - IV**

**Bioavailability of drug products:** Bioavailability tests. Bioequivalence. Compartment models and relevant pharmacokinetic parameters.

**UNIT - V**

**Pharmacogenetics:** Inter racial and individual variability in drug metabolism.

**REFERENCES:**

1. Shargel and Leon. Applied Biopharmaceutics and pharmacokinetics. Latest edition. Publisher: Prentice Hall, London.
2. Biopharmaceutics and Clinical Pharmacokinetics by, Milo Gibaldi b. Remington's Pharmaceutical Sciences, By Mack Publishing Company, Pennsylvania.
3. Pharmacokinetics: By Milo Gibaldi Donald, R. Mercel Dekker Inc.
4. Hand Book of Clinical Pharmacokinetics, By Milo Gibaldi and Laurie Prescott by ADIS Health Science Press.
5. Biopharmaceutics and Pharmacokinetics; By Robert F Notari f. Biopharmaceutics; By Swarbrick
6. Biopharmaceutics and Pharmacokinetics-A Treatise, By D. M. Brahmkar and Sunil B. Jaiswal, Vallabh Prakashan Pitampura, Delhi
7. Clinical Pharmacokinetics, Concepts and Applications: By Malcolm Rowland and Thomas, N. Tozer, Lea and Febiger, Philadelphia, 1995.

8. Dissolution, Bioavailability and Bioequivalence, By Abdou H.M, Mack, Publishing Company, Pennsylvania 1989.
9. Biopharmaceutics and Clinical Pharmacokinetics-An introduction 4th edltion Revised and expanded by Robert F Notari Marcel Dekker Inn, New York and Basel, 1987.
10. Encyclopedia of Pharmaceutical Technology, Vol 13, James Swarbrick, James, Roylan, Marcel Dekker Inc, New York 1996.



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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.Pharm I Year II Sem (Pharmacology)**

**QUALITY USE OF MEDICINES (Professional Elective - III)**

**Course Objective:** This course is designed to impart basic knowledge and skills that are required to practice quality use of medicines (QUM) in different healthcare settings and also to promote quality use of medicines, in clinical practice, through evidence-based medicine approach.

**Course Outcomes:** Upon completion of this course it is expected that students shall be able to:

- Understand the principles of quality use of medicines
- Know the benefits and risks associated with use of medicines
- Understand regulatory aspects of quality use of medicines
- Identify and resolve medication related problems
- Promote quality use of medicines
- Practice evidence-based medicines

**UNIT - I: Introduction to Quality use of medicines (QUM):** Definition and Principles of QUM, Key partners and responsibilities of the partners, Building blocks in QMC, Evaluation process in QMC, Communication in QUM, Cost effective prescribing.

**UNIT - II:** Concepts in QUM Evidence based medicine: Definition, concept of evidence-based medicine, Approach and practice of evidence-based medicine in clinical settings Essential drugs: Definition, need, concept of essential drug, National essential drug policy and list Rational drug use: Definition, concept and need for rational drug use, Rational drug prescribing, Role of pharmacist in rational drug use.

**UNIT - III: QUM in various settings:** Hospital settings, Ambulatory care/Residential care, Role of health care professionals in promoting the QUM, Strategies to promote the QUM, Impact of QUM on E-health, integrative medicine and multidisciplinary care. QUM in special population: Pediatric prescribing, Geriatric prescribing, prescribing in pregnancy and lactation, Prescribing in immune compromised and organ failure patients.

**UNIT - IV: Regulatory aspects of QUM in India:** Regulation including scheduling, Regulation of complementary medicines, Regulation of OTC medicines, Professional responsibility of pharmacist, Role of industry in QUM in medicine development.

**UNIT - V: Medication errors:** Definition, categorization and causes of medication errors, Detection and prevention of medication errors, Role of pharmacist in monitoring and management of medication errors Pharmacovigilance: Definition, aims and need for pharmacovigilance, Types, predisposing factors and mechanism of adverse drug reactions (ADRs), Detection, reporting and monitoring of ADRs, Causality assessment of ADRs, Management of ADRs, Role of pharmacist in pharmacovigilance.

**REFERENCES:**

1. A Textbook of Clinical Pharmacy Practice – Essential concepts and skills –Parthasarathi G, Karin Nyfort-Hansen and Milap Nahata
2. Andrews EB, Moore N. Mann's Pharmacovigilance
3. Dipiro JT, Talbert RL, Yee GC. Pharmacotherapy: A Pathophysiologic Approach
4. Straus SE, Richardson WS, Glasziou P, Haynes RB. Evidence-Based Medicine: How to practice and teach it
5. Cohen MR. Medication Errors

6. Online:  
[http://medicinesaustralia.com.au/files/2012/05/MA\\_QUM\\_External\\_Reduced.pdf](http://medicinesaustralia.com.au/files/2012/05/MA_QUM_External_Reduced.pdf)  
<http://curriculum.racgp.org.au/statements/quality-use-of-medicines/>  
[http://www.rug.nl/research/portal/files/14051541/Chapter\\_2.pdf](http://www.rug.nl/research/portal/files/14051541/Chapter_2.pdf)
7. Relevant review articles from recent medical and pharmaceutical literature.



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**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M.Pharm I Year I Sem (PHARMACY PRACTICE)**

**CLINICAL PHARMACY PRACTICE (Professional Core - II)**

**Course Objective:** This course is designed to impart the basic knowledge and skills that are required to practice pharmacy including the provision of pharmaceutical care services to both healthcare professionals and patients in clinical settings.

**Course Outcome:** Upon completion of this course it is expected that students shall be able to:

- Understand the elements of pharmaceutical care and provide comprehensive patient care services
- Interpret the laboratory results to aid the clinical diagnosis of various disorders
- Provide integrated, critically analyzed medicine and poison information to enable healthcare professionals in the efficient patient management

**UNIT - I**

**Introduction to Clinical Pharmacy:** Definition, evolution and scope of clinical pharmacy, International and national scenario of clinical MPP, Pharmaceutical care Clinical Pharmacy Services: Ward round participation, Drug therapy review (Drug therapy monitoring including medication order review, chart endorsement, clinical review and pharmacist interventions)

**UNIT - II**

**Clinical Pharmacy Services:** Patient medication history interview, Basic concept of medicine and poison information services, Basic concept of pharmacovigilance, Hemovigilance, Materiovigilance and AEFI, Patient medication counseling, Drug utilization evaluation, Documentation of clinical pharmacy services, Quality assurance of clinical pharmacy services.

**UNIT - III**

**Patient Data Analysis: Patient Data & Practice Skills:** Patient's case history – its structure and significances in drug therapy management, Common medical abbreviations, and terminologies used in clinical practice, Communication skills: verbal and non-verbal communications, its applications in patient care services. Lab Data Interpretation: Hematological tests, Renal function tests, Liver function tests

**UNIT - IV**

**Lab Data Interpretation:** Tests associated with cardiac disorders, Pulmonary function tests, Thyroid function tests, Fluid and electrolyte balance, Microbiological culture sensitivity tests

**UNIT - V**

**Medicines & Poison Information Services: Medicine Information Service:** Definition and need for medicine information service, Medicine information resources, Systematic approach in answering medicine information queries, Preparation of verbal and written response, establishing a drug information centre. **Poison Information Service:** Definition, need, organization and functions of poison information centre.

**REFERENCES**

1. A Textbook of Clinical MPP – Essential concepts and skills –Parthasarathi G, Karin Nyfort-Hansen and Milap Nahata
2. Practice Standards and Definitions - The Society of Hospital Pharmacists of Australia
3. Basic skills in interpreting laboratory data - Scott LT, American Society of Health System Pharmacists Inc

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**M.Pharm I Year I Sem (PHARMACY PRACTICE)**  
**PHARMACOTHERAPEUTICS- I (Professional Core - I)**

**Course Objective:** This course aims to enable the students to understand the different treatment approaches in managing various disease conditions. Also, it imparts knowledge and skills in optimizing drug therapy of a patient by individualizing the treatment plan through evidence-based medicines.

**Course Outcome:** Upon completion of this course it is expected that students shall be able to:

- Describe and explain the rationale for drug therapy
- Summarize the therapeutic approach for management of various disease conditions including reference to the latest available evidence
- Discuss the clinical controversies in drug therapy and evidence-based medicine
- Prepare individualized therapeutic plans based on diagnosis
- Identify the patient specific parameters relevant in initiating drug therapy, and monitoring therapy (including alternatives, time- course of clinical and laboratory indices of therapeutic response and adverse effect/s). Etiopathogenesis and pharmacotherapy of diseases associated with following systems

#### **UNIT- I**

Cardiovascular system: Hypertension, Congestive cardiac failure, Acute coronary syndrome, Arrhythmias, Hyperlipidemias. Hematological diseases: Anemia, Deep vein thrombosis, Drug induced hematological disorders

#### **UNIT- II**

Respiratory system: Asthma, Chronic obstructive airways disease, Drug induced pulmonary diseases  
Endocrine system: Diabetes, Thyroid diseases

#### **UNIT- III**

Gastrointestinal system: Peptic ulcer diseases, Reflux esophagitis, inflammatory bowel diseases, Jaundice, & hepatitis, Cirrhosis, Diarrhea and Constipation, Drug-induced liver disease

#### **UNIT-IV**

Bone and joint disorders: Rheumatoid arthritis, Osteoarthritis, Gout, Osteoporosis

#### **UNIT-V**

Dermatological Diseases: Psoriasis, Eczema and scabies, impetigo, drug induced skin disorders  
Ophthalmology: Conjunctivitis, Glaucoma

#### **REFERENCES:**

1. Roger and Walker. Clinical Pharmacy and Therapeutics – Churchill Livingstone publication
2. Joseph T. Dipiro et al. Pharmacotherapy: A Pathophysiologic Approach-Appleton & Lange
3. Robins SL. Pathologic basis of disease -W.B. Saunders publication
4. Eric T. Herfindal. Clinical Pharmacy and Therapeutics- Williams and Wilkins Publication
5. Lloyd Young and Koda-Kimble MA Applied Therapeutics: The clinical Use of Drugs- Lippincott Williams and Wilkins
6. Chisholm- Burns Wells Schwinghammer Malone and Joseph P Dipiro. Pharmacotherapy Principles and practice— McGraw Hill Publication
7. Carol Mattson Porth. Principles of Pathophysiology- Lippincott Williams and Wilkins
8. Harrison's. Principles of Internal Medicine - McGraw Hill
9. Relevant review articles from recent medical and pharmaceutical literature

**JAWAHARLAL NEHRU TECHNOLOGICAL UNIVERSITY HYDERABAD**  
**M. Pharm I Year I Sem (PHARMACY PRACTICE)**  
**CLINICAL TOXICOLOGY (Professional Elective – I)**

**Course Objective:** In the current scenario of accidental, homicidal and suicidal excessive consumption of drugs, pesticides, heavy metals and other poisonings, this elective helps the students to acquire the required knowledge and skills in the management of poisoning.

**Course Outcome:** At the end of the course the student is equipped with handling the first aid, elimination enhancement and treatment of poisoning and supportive care in poisoning due to

- Pesticides
- Drug over usage
- Heavy metals
- Radiation
- Snakes and anthropod bites
- Food poisoning

The student also gains knowledge in substance abuse and treatment of drug dependence.

**UNIT I**

General principles involved in the management of poisoning, antidotes and the clinical applications!

**UNIT II**

Supportive care in clinical toxicology. Gut decontamination, elimination enhancement and toxicokinetics.

**UNIT III**

Clinical symptoms and management of acute poisoning with the following agents –

- a) Pesticide poisoning: organophosphorus compounds, carbamates, organochlorines, pyrethroids.
- b) Opiates overdose. c) Antidepressants d) Barbiturates and benzodiazepines. e) Alcohol: ethanol, methanol. f) Paracetamol and salicylates. g) Non-steroidal anti-inflammatory drugs. h) Hydrocarbons: Petroleum products and PEG. i) Caustics: inorganic acids and alkalis. j) Radiation poisoning

**UNIT IV**

Clinical symptoms and management of chronic poisoning with the following agents –

- a) Heavy metals: Arsenic, lead, mercury, iron, copper b) Venomous snake bites: Families of venomous snakes, clinical effects of venoms, general management as first aid, early manifestations, complications and snake bite injuries. c) Plants poisoning. Mushrooms, Mycotoxins. d) Food poisonings e) Envenomations – Arthropod bites and stings.

**UNIT V**

Substance abuse: Signs and symptoms of substance abuse and treatment of dependence

- a) CNS stimulants: amphetamine
- b) Opioids
- c) CNS depressants
- d) Hallucinogens: LSD
- e) Cannabis group
- f) Tobacco

**REFERENCES:**

1. Matthew j ellenhorn. Ellenhorns medical toxicology – diagnosis and treatment of poisoning. Second edition. Williams and willkins publication, london b.
2. V V Pillay. Handbook of forensic medicine and toxicology. Thirteenth edition 2003 paras publication, Hyderabad

4. Thomas J Johnson, Critical Care Pharmacotherapeutics
5. Collen D L, Sneha B S, Fundamental Skills for Patient Care In MPP
6. Patient Assessment in Pharmacy, by Yolanda M H
7. Relevant review articles from recent medical and pharmaceutical literature



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