1.2.1: Percentage of Programmes in which Choice Based Credit System (CBCS)/ elective course system has been implemented

SUMMARY OF DOCUMENTS

Sr.No	Name of the Document	Page Number (From-To)
1	Minutes of BOS	02-17
2	Syllabi of programmes having CBCS system	18-33

Principal
Pravara Rural College of Pharmac
Pravaranagar, A/p. Loni-413736

University of Pune

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Ref. No. : CB/4582

Date : 11/12/2010

Circular No. 214 /2010

Sub : Regarding Semester Pattern with Credit System in the University Departments.

In continuation of Circular No. 168/2002 dated 11/14 June, 2002 for starting Semester Pattern with Credit System it is hereby clarified for information of all concerned that for purposes of Academic Flexibility the Course Structure and Course Contents of Departments/Centres/Institutions having Credit and Semester System can be different from the Course Structure and Contents for Departments/Centres/Institutions having non Credit Pattern of examination at PG level.

For the purpose of implementing this, the Departments/Centres/Institutions having Credit and Semester System shall draft the syllabus through the meeting of departmental committee consisting of all faculty members where the faculty strength is 10 or less or in a committee of not less than 8 faculty members where faculty strength is more than 10. This draft shall be submitted to the BOS in respective subjects for approval.

This procedure shall be uniform for all subjects of PG degrees where the credit system is implemented.

Such approved courses for both Credit and non-Credit system shall be duly notified on the website of the University.

16/12/10

Director
B.C.U.D.

Copy f.w.c.s. for information to:

1. The Dean, All Faculties
2. The Director, B.C.U.D.
3. The Head, All Departments
4. The Principal, All Affiliated Colleges
5. The Director, All Affiliated Institutes
6. The controller of Examinations
7. The Director, International Student's Center
8. The Director, Competitive Examination Center
9. The System Analyst, Data Processing Unit
10. The Deputy Registrar (Admission)
11. The Deputy Registrar (Examination 1, 2)
12. The Asstt. Registrar (Examination Co-Ordination Unit)
13. The Asstt. Registrar (Examination, S & T Unit)
14. The Asstt. Registrar (Strong Room)
15. The Asstt. Registrar (Records & Meeting)
16. The Law Officer
17. The Public Relation Officer
18. The Deputy Registrar, Planning and Development
19. The Deputy Registrar, Eligibility Section
20. The Section Officer, External Examination Center
21. The University Sub-Center's Ahmednagar & Nashik

Reference No.- Vice Chancellor, Note No. VC/5283, Dated 22/10/2010.

University of Pune

Manual

On

Semester Based,

Credit and Grading System

For

Post Graduates (PG) Programmes

Under

The Faculty of Pharmaceutical Science

With Effect from the Academic Year

2013-14

Semester based credit and grading system for M-pharm programme

Univerity of Pune has issued Rules and Regulations for the credit and Semester System in Post Graduate Centres of the affiliated colleges of the Univerity of Pune.(Ref:

In persuanceof the above decision to implement Credit System at the Post Graduate level and ensure continuous assessment, the UoP has decided to implement the Credit and Semester System (CSS) in all its affiliated colleges and recognised institutions where post graduate courses are conducted.

University of Pune under Faculty of Pharmaceutical Sciences conduct the folowing Post graduate Courses

1. Pharmaceutics
2. Pharmaceutical Chemistry
3. Pharmacology
4. Pharmacognosy
5. Quality assurance Techniques

The courses are partly by paper and partly by research.

The rules and regulations issued by Univerity of Pune as above need clearification. In view of this a manual is sought necessary which may help the college to implement the credit system without any confusion or ambiguity.

1. Rationale for introduction of Credit System:

"Enhanced learning opportunities, ability to match learners' scholastic needs and aspirations, improvement in educational quality and excellence, flexibility for learners to complete the programme in specified period of time, standardization and comparability of educational programmes."

Some of the specific advantages of using the Credit system as outlined in the available literature on the topic are as listed below:

2. Advantages of the Credit System:

- Represents a much-required shift in focus from ***teacher-centric to learner-centric*** education since the workload estimated is based on the investment of time in learning, not only in teaching.

- Helps to record course work and to document learner workload realistically since all activities are taken into account - not only the time learners spend in lectures or seminars but also the time they need for individual learning and the preparation of examinations etc.

- Segments learning experience into calibrated units, which can be accumulated in order to gain an academic award.

- Helps self-paced learning. Learners may undertake as many credits as they can cope with without having to repeat all the courses in a given semester if they fail in one or more courses. Alternatively, they can choose other courses and continue their studies.

- Affords more flexibility to the learners allowing them to choose inter-disciplinary courses, change majors, programmes, etc.

- Respects 'Learner Autonomy'. Allows learners to choose according to their own learning needs, interests and aptitudes.

- Makes education more broad-based. One can take credits by combining unique combinations. For example, if a learner is engaged in pharmacy practice or community pharmacy shall get benefit while earning credits for a course etc .

- Facilitates Learner Mobility. Offers the opportunity to study at different times and in different places. Credits earned at one institution can be transferred to another.

- Helps in working out twinning programmes.

- Is beneficial for achieving more transparency and compatibility between different educational structures.

- A credit system can facilitate recognition procedures as well as access to higher education for non-traditional learners.

3. Scientific approach to implementation

Any institution desirous of working out a comprehensive Credit system needs to adopt a systematic approach that handles most, if not all the aspects that need attention. Introducing the Credit system without adequate policy formulation and clear implementation guidelines is quite likely to encounter problems that are dealt with through *ad hoc* decisions. Such decisions may have long-term consequences which cannot easily be set right. Care has to be taken to see that the learner, who must be the ultimate beneficiary of the system, does not suffer academically because of absence of procedures or lack of adequate attention to detail when evolving the system. Apart from the fact that any form of injustice caused to the learner - the ultimate 'consumer' in the educational process – can lead to legal issues, the lack of a comprehensive approach may affect the key features like curricular flexibility, learner autonomy and learner mobility that are central to the system. The following major steps should, therefore, be taken by any higher education provider wanting to introduce the Credit System.

3.1 <u>At the Programme level</u>

a. Specify for each academic programme (eg M-Pharm),
   i. the programme structure (core courses, optional courses, etc and their year wise distribution if applicable),
   ii. entry level requirements,
   iii. minimum and maximum duration for successful completion,
   iv. programme objectives,
   v. teaching-learning strategies (number of teaching hours/lecture hours, tutorial hours, practical conduct hours, etc involved)
   vi. and evaluation components (nature and number of assignments, tutorials, tests, etc.) for the entire programme.
   vii. Identify also the modules / courses that may be studied either as part of the programme or may be taken up independently.
   viii. the syllabus to be considered under each course included in a given programme, specify the objectives of each course.
   ix. Break up the syllabus of each course into smaller components called 'Units' and state the Specific Learning Outcomes (SLO) for each Unit.
   x. Considering the nature of content to be studied for each course, number of lectures / practical's to be conducted and
   xi. the evaluation components to be completed under each course, distribute the credit points among the different course components of the programme to be completed in a given year.
   xii. As a thumb rule, each course should normally be in the range of 4 to 6 Credit Points.
   xiii. Allocate the course wise credits based on an estimate of the number of *hours that would be required by an average learner to fulfill the basic requirements of the course including time spent on attending lectures, preparing for all the evaluation components, etc.(learner's workload* =Learning hours).
   xiv. Credits should also be allocated to all the units included within a given course - for compulsory or core courses as well as elective courses.
   xv. Credits should also be allocated to project work, thesis, industrial placements, etc where these components are a part of a degree programme,

3.2 <u>At the institutional level:</u>

   i. Programme wise catalogues should be prepared in detail for all the academic programmes offered by the institution.

ii. Apart from basic information regarding admission procedure, fees to be paid, eligibility criteria, academic calendar and overall programme structure,

iii. each catalogue should contain other details like course choices available, course wise syllabi, course wise learning outcomes (what learners are expected to know, understand and be able to do after studying a given course)

iv. and workload (the time learners typically need to achieve the learning outcomes), expressed in terms of credits.

v. The programme wise catalogues thus prepared should be published in print form as well as made available on the web for open and transparent dissemination of information to all.

vi. An internal Coordination Committee should be established to handle all matters related to the implementation of the Credit System. Apart from assisting in inter-departmental coordination, this Committee should also look into matters like inter-institutional credit transfer arrangements and course equivalence with the assistance of the concerned departments/officials from the university.

vii. Transcript of record describing learning achievements of the concerned learner may be given in proforma on demand while seeking admission for higher studies.

4. Basic Concepts

Some Key Terms

i. **Program:**

A 'Program' is a set of courses that are linked together in an academically meaningful way and generally ends with the award of a Certificate or Diploma or Degree depending on the level of knowledge attained and the total duration of study. For example:
M-Pharm (Pharmaceutics)
M-Pharm (Pharmacology)
M-Pharm (Pharmaceutical Chemistry)
M-Pharm (Quality Assurance Techniques)
M-Pharm (Pharmacognosy) are Programs, not Courses.

ii. Course:

A 'course' in simple terms corresponds to the word 'subject' used in many universities. A course is essentially a constituent of a 'program' and may be conceived of as a composite of several learning topics taken from a certain knowledge domain, at a certain level. All the learning topics included in a course must necessarily have academic coherence, that is, there must be a common thread linking the various components of a course.

iii. Units:

A course consists of units, and unit consists of topics.

iv. Credit Point:

This has a reference to the **'***Workload'* of a learner and is an index of the number of learning hours deemed for a certain segment of learning. These learning hours may include a variety of learning activities like *reading, reflecting, discussing, attending lectures / counseling sessions, watching especially prepared videos, writing assignments, preparing for examinations, etc.*. Generally, a system of assigning Credit Points (CP) for a single course is practiced in most countries across the globe. Credits assigned for a single course always pay attention to how many hours it would take for an average learner to complete a single course successfully. *The fallacy of assigning credits to a course purely based on how many lectures (teaching hours) are conducted for a learner at a certain level needs to be avoided. 1 credit is construed as corresponding to approximately 15 learning hours.*

Viz: lectures conducted are the teaching hours which are not equal to learning hours.

v. Credit completion and Credit accumulation:

Each program is assigned a credit number which is maximum for example

As per Pune university

M Pharm program which is partly by paper partly by research

the learner has to earn 100 credits with average credit of 25 to be earned in each of the semester. The proportion of laboratory work shall be around 40% of total credits. The first two semesters are by paper, and two semesters are by research.

Total credits	*Sem I*	*SemII*	*SemIII*	*Sem IV*
100	*52*		*48*	
	6 Theory courses X 4 credits =24 credits *2 Thery courses X 3 credits =06credits* *3 Practical courses X 4 credits=12credits* *2 Seminar=04 credits* *Research work=06 credits*		*Seminar on Research topic=4 credits* *Seminar on recent trends in Pharmaceutical Sciences=4 credits* *Research work=18 credits*	*Seminar on dessertation =4 credits* *Research work=18 credits*
	Total=52 credits		*Total=48credits*	

One semester is about 19 to 20 weeks including examination days and period for preparation for examination.

vi. Credit Point (CP):

ONE credit point is equivalent to 15 clock hours of workload of learner calculated as teacher-student contact per semester.

workload of learner = Lecture hours (Face to face teaching) + notional learner work load

Thus if a student has attended all the classroom teaching or lectures for a course it does not mean that he has earned 100% credit assigned for the course as it has to include the notional workload of the learner.

Notional workload of the learner includes reading, discussions,assignments etc. It is evaluated by preparing spread sheet having well defined parameters that should reflect the participation in the classroom teaching and further learning by the student.

The proportion of face to face and notional may vary from course to course.

e.g: Suppose a course has been assigned 04 credits to be earned over a period of one semester.

4 credits = 60 hours in 15 weeks= 04 hours per week

4 credits = 120 hours in 15 weeks =08 hours per week

The hours per week should not be considered as no of lectures per week.

The proportion may vary 50; 50 or 75;25 or 25;75 etc depending on the type of course.

e.g. Biopharmaceutics-the notional learner load can be in the form of tutorials as numerical problem

Regulatory affair it can be a case study/field work/mini presentation etc.

Thus credit completion or acquisition of credit is ***necessary for the grant of term.*** However acquisition of 75 % credit cannot be considered adequate to grant the term.

Credit allotted= credit earned=term granted

A model Credit structure for four semesters Program:

	Course 1	Course 2	Course 3	Course 4	Course 5	Course 6	Course 7 Seminar	Course 8 Research work
semI	4	4	4	4	4	3	2	--
Sem II	4	4	4	4	3	--	2	6
Sem III	---------- 26* ----------							
Sem IV	---------- 22* ----------							

*the credit will be earned by progress of research project

As (01 credit=15 hours)

18+18 credits in sem III or IV will be very less time span to get a research project completed

If we presume that a student spends 5 -6 hour in research related work.

6x 6=36 hours per week or 36x 20=720 hours per sem=25 credits Thus for earning one credit in research a student has to work for 25 to 30 hours

Thus 01 credit=25-30 hours spent in research & related work

The level of performance of a student in the form of marks or grade has no bearing on the no of credits earned collected by the student.

Thus each course of an academic program that has been assigned specific credit points also has a certain scheme of learner evaluation as well as certain specific criteria defining successful completion. Credit completion or Credit acquisition may

be considered to take place after the learner has successfully cleared all the evaluation criteria with respect to a single course.

vii. Credit Transfer:

Apart from maintaining an account of credits acquired by a learner over a period of time for a wide range of courses, the main idea behind implementing the credit system is to make provision for learner mobility. Credit Transfer means that credits earned at one institution for one or more courses under a given program are accepted under another program either by the same institution or another institution.

viii. Grading:

The word Grade is derived from the latin word gradus, meaning ,step. Grading, in the educational context is a method of reporting the result of a learner's performance subsequent to his evaluation. It involves a set of alphabets which are clearly defined and designated and uniformly understood by all the stake holders. A properly introduced grading system not only provides for a comparison of the learner's performance but it also indicates the quality of performance but it also indicated the quality of performance with respect to the amount of efforts put in and the amount of Knowledge acquired at the end of the course by the learners.

---

5. Evaluation System

The continuous evaluation is the soul of credit and grading system therefore Assessment consists of

a) In semester continuous assessment and

b) End semester assessment.

The scheme of Examination shall be divided into two parts: an ***In semester continuous assessment and End semester assessment*** (semester end examination). ***In semester continuous assessment*** includes Assignments, Seminars, Case Studies, Quizzes, Viva, Open book test, Unit Tests etc..

In semester continuous assessment	***End semester assessment***	**Total (for each course or head of passing)**
50 %	**50%**	**100%**

In semester continuous assessment of 50 % for each course will be as follows**:**

a. Course: Theory

Sr. No	Evaluation type	Marks	Test
1	Assignments/Short Quiz/*mini*Project / Term paper/ Extension work (Any two) Active participation in routine class instructional deliveries(Open book test/ seminars/ presentation) One case study	10 05 05	I
2	One Unit Test (multiple choice questions objective/descriptive)	30	II

b. Course: Practical

Sr. No	Evaluation type	Marks	Test
1	Individual Practical (all practicals) (Day to day assessment) Viva Jounal	10 05 05	I
4	Internal Practical exam	30	II

c. Course: Seminar

Sr. No	Evaluation type	Marks
1	Ref work & Scientific contents	10
2	Communication skill	05
3	Discussion /Defence	05
4	Presentation	30

Structuring of the program in terms of units is necessary. The units tobe examined are tobe notified for *In semester continuous assessment time to time. Every unit needs tobe included in tests/continuous evaluation step by step.*
All units are tobe included in the *End semester assessment.*

Illustration:

Course: Theory:

	Test I							
Paper/ Course	**Cr**	**Assignments/Short Quiz/*mini*Project / Term paper/ Extension work (Any two)**	Active participation in routine class instructional deliveries(Open book test/ seminars/ presentation) One case study	**Unit Test**	**Internal 50**	**External 50**	**Total**	**Grade Point**	**Letter grade**
	4	**10**	**10**	**30**	**20/50**	**20/50**	**50/100**		
I	4	7	7	20	34	40	74	5	A

PERFORMANCE GRADING:

For converting marks in to Grade point

Grade	Marks out of 100	Marks out of 50	Grade Points
O: Outstanding	100 to 75	50 to 38	6
A: Very Good	74 to 65	37 to 33	5
B: Good	64 to 55	32 to 28	4
C: Average	54 to 50	27 to 25	3
D: Satisfactory	49 to 45	24 to 22	2
E: Pass	44 to 40	21 to 20	1
F: Fail	39 to 0	19 to 0	0

Final Grade Points:

Grade Points	Grade
05.00-6.00	O
04.50-04.99	A
03.50-04.49	B
02.50-03.49	C
01.50-02.49	D
00.50-01.49	E
00.00-00.49	F

Mode of conduct of Internal Assessment for Additional Examination
Class test or assignment for Internal Assessment:

If a student misses an internal assessment examination he/she will have a second chance with the permission of the Principal in consultation with concern teacher. Such a second chance shall not be the right of the student.
In case he/she wants to repeat internal assessment he/she can do only by registering for the said courses during the 3rd and 4th Semester.

Calculations of SGPA & CGPA

The formula for GPA will be based on weighted average. The final GPA will not be printed unless a student passes courses equivalent to 100 credits.

(i) Semester Grade Point Average (SGPA) =

$$\text{SGPA} = \frac{\sum_{i=1}^{F} CiGi}{\sum_{i=1}^{F} Ci}$$

$$\text{SGPA} = \frac{\sum \text{Grade Points Earn} \times \text{Credits for each course}}{\text{Total Credits}}$$

(ii) Cumulative Grade Point Average (CGPA) =

$$\textbf{CGPA} = \frac{\sum_{i=1}^{F} CiGi}{\sum_{i=1}^{F} Ci}$$

$$\textbf{SGPA} = \frac{\sum Total\ Points\ Earn \times Credits\ for\ each\ course}{Total\ Credits}$$

If the GPA is higher than the indicated upper limit in the three decimal digit then the student be awarded higher final grade (e.g. a student getting GPA of 4.492 may be awarded 'A')
There will be only final compilation and moderation at GPA (Final) level done at the department. While declaring the result the existing relent ordinances are applicable. There is also a provision for verification and revaluation. In case of verification, the existing rules will be applicable. The revaluation result will be adopted if there is a change of at least 10 % marks and in the grade of course.

Grade card:

The grade card will reflect the marks obtained by the learner, Credit points of the individual Course as well as Semester, conversion of marks into grades, calculation of SGPA for each individual semester and the CGPA for the complete Programme at the end of the final semester.

A model proforma:

Courses in the semester	**Marks obtained**	**Grade**	**Grade Points**	**Credit(C)per course**	**Credit Earned**	**CG= (CxG)**	**SGPA= ΣCG/ ΣC**
Course-I							
Course-II							
Course-III							
Course-IV							
Course-V							
Course-VI							
Passes **Total Credits=** **Credit Earned=**					**ΣC=**	**ΣCG=**	**Grade=**

College logo

University of Pune
ABC College of Pharmacy
Address
GRADE CARD

Programme:M. Pharm (Pharmaceutics) **Semester: First Semester**

Photo

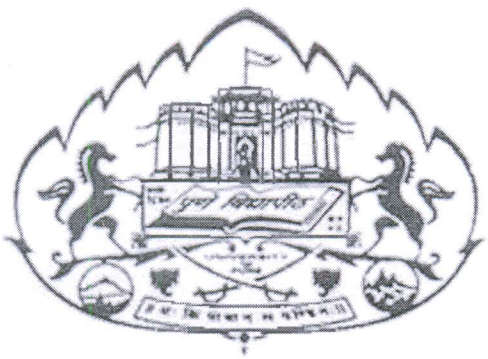
Examination Seat No.	Name of the candidates	Month &Year of examination

Course Code	Course Title	Marks Obtained		Marks (100)	Grade	Grade Point	Credit Point	CG=CXG	GPA= ΣCG/ ΣC
		Int.Asst (50)	Ext.Asst (50)						
M.1.1	Advanced analytical Techniques	30	35	65	A	5	4	20	
M.1.2	Advanced analytical Techniques(Practical)	35	40	75	O	6	4	24	
M.1.3	Research Methodology	35	35	70	A	5	4	20	5.4
M.1.4	Advanced Pharmaceutics	40	44	84	O	6	4	24	
M.1.5	Advanced Pharmaceutics(Practical)	45	40	85	O	6	4	24	
E.1.4	Elective I (SPT)	35	32	67	A	5	3	15	
	Seminar	32		32/50	B	4	2	08	
							ΣC=25	ΣCG=135	Grade=O
Remarks: Passes Credit Earned: 25							SGPA=5.4		

Result Declared on: Chairperson (exam) Principal

UNIVERSITY OF PUNE

FACULTY OF PHARMACEUTICAL SCIENCES



MASTER OF PHARMACY (M.PHARM.) in

1. Pharmaceutics
2. Pharmaceutical chemistry
3. Pharmacology
4. Pharmacognosy
5. Quality assurance techniques

COURSE STRUCTURE & SYLLABI

(EFFECTIVE FROM ACADEMIC YEAR 2013-2014)

PRINCIPAL
Pravara Rural College of Pharmacy

PRAVARA RURAL COLLEGE OF PHARMACY
PRAVARANAGAR

MASTER OF PHARMACY COURSE STRUCTURE
SPECIALIZATION : PHARMACEUTICAL CHEMISTRY

Sem. No	Paper	Scheme of Teaching Hrs/Weeks		Scheme of Credit		Scheme of Examination Theory			Practical			Total (Including 50 marks of Internal assessment)
						Hrs.	Marks		Hrs.	Marks		
		Theory	Practical	Theory	Practical	UE	UE	IE	UE	UE	IE	
I	M Advanced Analytical Techniques	4	8	4	4	3	50	50	8	50	50	200
	M-2 Research Methodology	4		4		3	50	50				100
	M-I-1 Advanced Pharmaceutical Chemistry	4	8	4	4	3	50	50	8	50	50	200
	M-I-2 Elective-I	3		3		3	50	50				100
	Seminar				2			50				50
II	M-I-3 Advanced Medicinal Chemistry	4	8	4	4	3	50	50	8	50	50	200
	M-3 Drug Regulatory Affairs	4		4		3	50	50				100
	M-I-4 Drug Design	4		4		3	50	50				100
	M-I-5 Elective-II	3		3		3	50	50				100
	Seminar		4		2			50				50
	Research work		12		6			50				50
III	Seminar on Research Envisaged for Dissertation				4		50					50
	Seminar on recent trends in Pharmaceutical Chemistry				4			50				50
	Research work		36		18			150				150
IV	Seminar on Dissertation				4		50					50
	Research work		36		18		150					150
	Dissertation & Defense (viva/voce)						100					100
			Total	30	70					Grant Total		1800
			Total Credits = 100									

PRINCIPAL
Pravara Rural College of Pharmacy
Pravaranagar, A/p. Loni-413736

MASTER OF PHARMACY COURSE STRUCTURE
SPECIALIZATION : QUALITY ASSURANCE TECHNIQUES

Sem. No	Paper	Scheme of Teaching Hrs/Weeks		Scheme of Credit		Scheme of Examination Theory			Practical			Total (Including 50 marks of Internal assessment)
						Hrs.	Marks		Hrs.	Marks		
		Theory	Practical	Theory	Practical	UE	UE	IE	UE	UE	IE	
I	M Advanced Analytical Techniques	4	8	4	4	3	50	50	8	50	50	200
	M-2 Research Methodology	4		4		3	50	50				100
	M-I-1 Advanced Quality Assurance Techniques (CGMP & Documentation)	4	8	4	4	3	50	50	8	50	50	200
	M-I-2 Elective-I	3		3		3	50	50				100
	Seminar				2			50				50
II	M-I-3 Pharmaceutical Validation	4	8	4	4	3	50	50	8	50	50	200
	M-3 Drug Regulatory Affairs	4		4		3	50	50				100
	M-I-4 Quality Planning and Analysis	4		4		3	50	50				100
	M-I-5 Elective-II	3		3		3	50	50				100
	Seminar		4		2			50				50
	Research work		12		6			50				50
III	Seminar on Research Envisaged for Dissertation				4		50					50
	Seminar on recent trends in Quality Assurance Techniques				4			50				50
	Research work		36		18			150				150
IV	Seminar on Dissertation				4		50					50
	Research work		36		18		150					150
	Dissertation & Defense (viva/voce)						100					100
			Total	30	70					Grant Total		1800
			Total Credits = 100									

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MASTER OF PHARMACY COURSE STRUCTURE
SPECIALIZATION : PHARMACOGNOSY

Sem. No	Paper	Scheme of Teaching Hrs/Weeks		Scheme of Credit		Scheme of Examination Theory			Practical			Total (Including 50 marks of Internal assessment)
						Hrs.	Marks		Hrs.	Marks		
		Theory	Practical	Theory	Practical	UE	UE	IE	UE	UE	IE	
I	M Advanced Analytical Techniques	4	8	4	4	3	50	50	8	50	50	200
	M-2 Research Methodology	4		4		3	50	50				100
	M-I-1 Advanced Pharmacognosy	4	8	4	4	3	50	50	8	50	50	200
	M-I-2 Elective-I	3		3		3	50	50				100
	Seminar				2			50				50
II	M-I-3 Phytochemistry & Phytopharmaceuticals	4	8	4	4	3	50	50	8	50	50	200
	M-3 Drug Regulatory Affairs	4		4		3	50	50				100
	M-I-4 Industrial Pharmacognosy	4		4		3	50	50				100
	M-I-5 Elective-II	3		3		3	50	50				100
	Seminar		4		2			50				50
	Research work		12		6			50				50
III	Seminar on Research Envisaged for Dissertation				4		50					50
	Seminar on recent trends in Pharmacognosy				4			50				50
	Research work		36		18			150				150
IV	Seminar on Dissertation				4		50					50
	Research work		36		18		150					150
	Dissertation & Defense (viva/voce)						100					100
			Total	30	70					Grand Total		1800
		Total Credits = 100										

PRINCIPAL
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Pravaranagar, A/p. Loni-413736

PRAVARA RURAL COLLEGE OF PHARMACY • PRAVARANAGAR •

SEMESTER-I

(M. 1. 1) Advanced Analytical Techniques
(M. 1.2) Advanced Analytical Techniques (Practical)
(M.1.3) Research Methodology
(M.1.4) Advanced Pharmaceutics
(M.1.5) Advanced Pharmaceutics (Practical)
(M.1.6) Advanced Pharmaceutical Chemistry
(M.1.7) Advanced Pharmaceutical Chemistry (Practical)
(M.1.8) Advance Pharmacology (Preclinical Evaluation of Drugs)
(M.1.9) Advance Pharmacology (Preclinical Evaluation of Drugs) (Practical)
(M.1.10) Advanced Pharmacognosy
(M.1.11) Advanced Pharmacognosy (Practical)
(M.1.12) Advanced Quality Assurance Techniques (cGMP & Documentation)
(M.1.13) Advanced Quality Assurance Techniques (cGMP & Documentation) (Practical)

SEMESTER-II

(M.2.1) Drug Regulatory Affairs
(M.2.2) Formulations & Development
(M.2.3) Formulations & Development (Practical)
(M.2.4) Novel Drug Delivery Systems
(M.2.5) Advanced Medicinal Chemistry
(M.2.6) Advanced Medicinal Chemistry (Practical)
(M.2.7) Drug Design
(M.2.8) Clinical Pharmacology
(M.2.9) Clinical Pharmacology (Practical)
(M.2.10) Molecular Pharmacology
(M.2.11) Phytochemistry & Phytopharmaceuticals
(M.2.12) Phytochemistry & Phytopharmaceuticals (Practical)
(M.2.13) Industrial Pharmacognosy
(M.2.14) Pharmaceutical Validation
(M.2.15) Pharmaceutical Validation (Practical)
(M.2.16) Quality Planning And Analysis

ELECTIVE SUBJECTS OF ALL SEMESTERS

(E.1.1) Quality Control & Assurance of Pharmaceuticals
(E.1.2) Pharmaceutical Plant Design and Operations
(E.1.3) Biopharmaceutics and Pharmacokinetics
(E.1.4) Sterile Products Formulation & Technology
(E.1.5) Active Pharmaceutical Ingredients (APIs) Manufacturing Technology
(E.1.6) Chemistry of Medicinal Natural Products

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(E.1.7) Traditional Systems of Medicine & Ayurvedic Formulations
(E.1.8) Medicinal Plant Biotechnology
(E.1.9) Natural Products Management
(E.1.10) Quality Assurance Techniques In Herbal Products
(E.1.11) Toxicology
(E.1.12) Safety Pharmacology
(E.1.13) Clinical Trials
(E.1.14) Clinical Pharmacokinetics and Pharmacodynamics
(E.1.15) Clinical Immunology and Enzymology
(E.1.16) Industrial Pharmacy And Production Management
(E.1.17) Fermentation Technology
(E.1.18) Project Management
(E.1.19) Pharmaceutical Administration
(E.1.20) Cosmeticology

Priya
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2. Current Concepts in Pharmaceutical Sciences: Biopharmaceutics, Swarbick. J, Lea and Febiger, Philadelphia.1970.
3. Clinical Pharmacokinetics Concepts and Applications 3rd edition by Malcolm Rowland and Thomas N. Tozer, Lea and Febiger, Philadelphia, 1987.
1. 44
4. Dissolution, Bioavailability and Bioequivalence, Abdou. H. M. Mack Publishing Company, Pennsylvania, 1989.
5. Biopharmaceutics and Clinical Pharmacokinetics, an Introduction, 4th edition, revised and expanded by Robert, E. Notari, Marcel Dekker Inc, New York and Basel, 1987.
6. Biopharmaceutics and relevant Pharmacokinetics, by John. G. Wagner and M. Pernarowski, Ist edition, Drug Intelligence Publications, Hamilton, Illinois, 1971.
7. Encyclopedia of Pharmaceutical Technology, Vol 13, James Swarbrick, James. C. Boylan, Marcel Dekker Inc, New York, 1996.
8. Biopharmaceutics and Clinical Pharmacokinetics by Milo Gibaldi, 4th edition, Philadelphia, Lea and Febiger, 1991
9. Biopharmaceutics and Pharmacokinetics, A Treatise, D. M. Brahmankar and Sunil B. Jaiswal, Vallabh Prakashan, Pitampura, Delhi
10. Applied Biopharmaceutics and Pharmacokinetics by Shargel. L and Yu ABC, 2nd edition, Connecticut, Appleton Century Crofts, 1985.
11. Textbook of Biopharmaceutics and Pharmacokinetics, Dr. Shobha Rani R. Hiremath, Prism Books Pvt Ltd, Banglore, 2000.

(E.1.4) STERILE PRODUCTS FORMULATION & TECHNOLOGY

(Theory 3 Hrs/Week)

CREDITS 03

UNIT I

A) FORMULATIONS

1. Preformulation: Physico-chemical properties of materials used in perenteral formulations. Selection of polymeric components. Selection of packaging components of packaging components.
2. Formulation of SVP and LVP: Requirement, components, materials, Pharmacopoeial requirements, special types of parenterals such as suspensions, emulsions, dried forms, Variables in formulation development.

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3. Ophthalmic Products: Ocular anatomy and physiology relevant to ocular drug delivery, ocular Pharmacokinetics, conventional products, ocular inserts, particulate and liposome drug delivery, protein and peptide delivery.
4. Sustained Release Parenterals: Liposome's, and niosomes, nanoparticles, proteins and peptides, implants, loaded erythrocytes.

UNIT II

B) TECHNOLOGY- Manufacturing of Parenterals

6. Layout of parenteral facilities, FFS and BFS technology for parenterals.
7. Environmental control: Temperature and humidity control, air handing systems and their validation.
8. Industrial sterilization: Large-scale sterilization processes, process selection, specifications, development and validation of process and equipment.
9. Parenteral devices such as syringes, cannula, catheters.
10. Guidelines: Overview of GMP and regulatory guidelines.
11. Hazards associated with parenteral therapy

Recommended Books:

1. K. E. Avis, H. A. Liebermann and Lachman; Pharmaceutical dosage forms: Parenteral Medications: Vol. 1,2,3, Marcel Dekker.
2. S. J. Turco Sterile Dosage Forms: their preparation and clinical application; Lee and Febiger.
3. N. K. Jain; Controlled and Novel drug delivery: CBS Publication.
4. J. R. Robinson and H. L. Lee; Controlled drugs delivery: Fundamentals and Applications; Marcel Dekker.
5. F. J. Carleton and J. P. Agalloco: Validation of aseptic pharmaceutical processes: Marcel Dekker.
6. L. A. Trissel: Handbook on injectable drugs; American Society for Hospital Pharmacist Publication.
7. N. A. Halls; Achieving sterility in medical and pharmaceutical products; Marcel and Dekker.

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10. Sterile Pharmaceutical Products: GMP aspects related to sterile products- General guidelines, personnel, building and premises, equipment, sanitation, processing, sterilization, Quality control and validation, Documentation

Recommended Books:

1. Pharmaceutical Quality Assurance, MA Potdar, Nirali Prakashan, Pune
2. Validation of Pharmaceutical process, F. J. Carleton and J. Agalloco, Marcel Dekker Inc.
3. Pharmaceutical Process Validation, Second Ed., Ira R. Ferry & Robert Nash., Marcel Dekker Inc.
4. Quality Planning & Analysis by J. M. Juran and F. M. Gryna, Tata Mcgraw Hill, India.
5. Improving Quality through Planned experimentation by Moen, Tata Mcgraw Hill.
6. Good Manufacturing Practices for Pharmaceutical; A Plan for total Quality Control, 4 th Ed, Sidney willing.
7. Quality Assurance Guide by Organization of Pharmaceutical producers of India.
8. Pharmaceutical Process Validation; By F. R., Berory and Robert A. Nash
9. Impurities Evaluation of Pharmaceutical; Satinder Ahiya Marcel Decker.42
10. Quality Control of Packaging material in the Pharmaceutical Industry: Kenneth Harburn, Marcel Dekker.
11. Juran's Quality Control Handbook J.M. Jupron.4th Ed. Good design practices for GMP Pharmaceutical facilities. Andrew A Signature, Marcel Dekker.
12. cGMP for Pharmaceuticals. Pharma. Med. Press, I st edition by Manohar H. Potdar

(E.1.2) PHARMACEUTICAL PLANT DESIGN AND OPERATIONS

(Theory 3 Hrs/Week)

CREDITS 03

UNIT I

1. Regulatory requirements of Pharma facilities with reference to cGMP, revised schedule M and Factory Act
2. Design, layout and operational facilities with services and utilities for Tablets, Capsules, Liquid orals, Ointments and Dry syrups.

UNIT II

3. Design, layout and operational facilities with services and utilities for sterile products powders ready for reconstitution

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4. Design and operation of Q.C. Laboratory

UNIT III

5. Design of utility services - Water - stream- Compressed air and other gases
6. Design of effluent treatment plant

UNIT IV

7. Designing of plant support services like security office, vehicle parking, fuel storage, canteen and cooking, garden and horticulture, scrap yards, Administrative block and training centre, sports and entertainment block, resident managers bungalow, residences for essential service staff, toilet facilities, medical services, crush

Recommended Books:

1. Project Management by Clifford F. Gray and Erik W. Larson Publisher: McGraw Hill company.
2. Pharmaceutical Production facilities: Design and applications by Graham Cole. Publisher: Taylor & Francis
3. Production/Operations Management by: El wood Bufa Publisher: Wiley Eastern Limited (New Delhi)
4. S. J. Turco; Sterile Dosage Forms: their Preparation and Clinical Applications; Lee and Febiger.
5. N. K. Jain; Controlled and novel drug delivery: CBS Publication.
6. J. R. Robinson and H. L. Lee; Controlled Drug Delivery: Fundamentals and Applications; Marcel Dekker.
7. F.J. Carleton and J.P.Agalloco; Validation of aseptic pharmaceutical processes: Marcel Dekker.
8. L. A. Trissel: Handbook on injectable drugs; American Society for Hospital Pharmacist Publication.43
9. N.A. Halls; Achieving sterility in medical and pharmaceutical products; Marcel and Dekker.
10. Planning and control by: Samuel Eilon Publisher: Universal book corporation, Mumbai.

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सावित्रीबाई फुले पुणे विद्यापीठ

(पूर्वीचे पुणे विद्यापीठ)

दूरध्वनी क्रमांक :
०२०—२५६०१२५८
२५६०१२५९

शैक्षणिक विभाग
गणेशखिंड, पुणे—४११ ००७
वेबसाइट : www.unipune.ac.in
ई—मेल : boards@pun.unipune.ac.in

संदर्भ क्र. :सी.बी./फार्म./६६०

दिनांक : 23/06/2018

परिपत्रक क्रमांक. १२६/२०१८

विषय :— विज्ञान व तंत्रज्ञान विद्याशाखेंतर्गत औषधनिर्माणशास्त्राचा **'प्रथम वर्ष बी.फार्म.'** व **'प्रथम वर्ष एम.फार्म.'** अभ्यासक्रम शैक्षणिक वर्ष २०१८—१९ पासून सुरू करणेबाबत...

विद्यापीठ अधिकार मंडळाने घेतलेल्या निर्णयानुसार सर्व संबंधितांस या परिपत्रकाद्वारे कळविण्यात येते की, विज्ञान व तंत्रज्ञान विद्याशाखेंतर्गत औषधनिर्माणशास्त्राचा **'प्रथम वर्ष बी.फार्म.'** व **'प्रथम वर्ष एम.फार्म.'** अभ्यासक्रम शैक्षणिक वर्ष २०१८—१९ पासून लागू करण्यास मान्यता देण्यात येत आहे.

सदर अभ्यासक्रमाच्या विषयांची सूची सावित्रीबाई फुले पुणे विद्यापीठाच्या www.unipune.ac.in या वेबसाईटवर Syllabi – Academic Year 2018 – Faculty of Science and Technology (Pharmaceutical Sciences) या शीर्षकाखाली उपलब्ध आहे.

सावित्रीबाई फुले पुणे विद्यापीठाच्या सर्व संलग्न औषधनिर्माणशास्त्र महाविद्यालयांचे मा. प्राचार्य यांना विनंती की, सदर परिपत्रकाचा आशय सर्व संबंधितांच्या निदर्शनास आणून द्यावा.

23/6/18

उपकुलसचिव
(शैक्षणिक विभाग)

प्रत माहितीसाठी व पुढील योग्य त्या कार्यवाहीसाठी:—

१. मा. अधिष्ठाता, विज्ञान व तंत्रज्ञान विद्याशाखा
२. मा. प्राचार्य, सर्व औषधनिर्माणशास्त्र महाविद्यालये
३. मा. संचालक, सर्व मान्यताप्राप्त संस्था
४. मा. संचालक, परीक्षा व मूल्यमापन मंडळ, सा. फु. पुणे विद्यापीठ,पुणे — ७.
५. मा. संचालक, स्पर्धा परीक्षा केंद्र
६. मा. उपकुलसचिव, परीक्षा (१,२)
७. मा. उपकुलसचिव, नियोजन व विकास विभाग
८. मा. उपकुलसचिव, शैक्षणिक पात्रता विभाग
९. मा. उपकुलसचिव, सभा व दप्तर विभाग
१०. मा. संचालक, आंतरराष्ट्रीय केंद्र
११. मा. उपकुलसचिव, शैक्षणिक प्रवेश विभाग
१२. सहायक कुलसचिव, गोपनीय कक्ष
१३. सहायक कुलसचिव, परीक्षा—एस.ॲण्ड टी. विभाग
१४. सहायक कुलसचिव, परीक्षा समन्वय
१५ सहायक कुलसचिव, मा. प्र—कुलगुरू कार्यालय
१६. वरिष्ठ कायदा अधिकारी
१७. जनसंपर्क अधिकारी
१८. कक्षाधिकारी, बहि:स्थ विभाग
१९. प्रमुख, विद्यापीठ उपकेंद्र : अहमदनगर, नाशिक.

वि.प. ठराव क्र. ब १० पीए/१०/२०१८, दि. ०७ जून, २०१८

सावित्रीबाई फुले पुणे विद्यापीठ

(पूर्वीचे पुणे विद्यापीठ)

दूरध्वनी क्रमांक :
०२०—२५६९१२३३
२५६०१२५८
२५६०१२५९

शैक्षणिक विभाग
गणेशखिंड, पुणे—४११ ००७
टेलिग्राफ : 'युनिपुणे'
फॅक्स : ०२०—२५६९१२३३
वेबसाइट : www.unipune.ac.in
इ—मेल : boards@pun.unipune.ac.in

संदर्भ क्र. :सी.बी./~~इन्जि.८~~/फार्म/ ५४५

दिनांक : २८.०६.२०१६

परिपत्रक क्रमांक. ९०० /२०१६

विषय:— औषधनिर्माणशास्त्र विद्याशाखेंतर्गत द्वितीय वर्ष बी. फार्म. श्रेयांक पध्दती (२०१५ पॅटर्न) अभ्यासक्रमास मान्यता देण्याबाबत.....

विद्यापीठ अधिकार मंडळाने घेतलेल्या निर्णयानुसार सर्व संबंधितांस या परिपत्रकाद्वारे कळविण्यात येते की, औषधनिर्माणशास्त्र विद्याशाखेंतर्गत द्वितीय वर्ष बी. फार्म. श्रेयांक पध्दती (२०१५ पॅटर्न) अभ्यासक्रमास शैक्षणिक वर्ष २०१६—१७ पासून मान्यता देण्यात येत आहे.

सदर अभ्यासक्रम सावित्रीबाई फुले पुणे विद्यापीठाच्या www.unipune.ac.in या वेबसाईटवर Syllabi– Pharmaceutical Science या शीर्षकाखाली उपलब्ध आहे.

सावित्रीबाई फुले पुणे विद्यापीठाच्या सर्व संलग्न औषधनिर्माणशास्त्र महाविद्यालयांचे मा. प्राचार्य यांना विनंती की, सदर परिपत्रकाचा आशय सर्व सबंधित प्राध्यापक व विद्यार्थ्यांच्या निदर्शनास आणून द्यावा.

२८/६/१६

संचालकांकरिता
(म.वि.वि.मं)

कृ. मा. प.

प्रत माहितीसाठी व पुढील योग्य त्या कार्यवाहीसाठी:—

१. मा. समन्वयक, औषधनिर्माणशास्त्र विद्याशाखा
२. मा. संचालक, म.वि.वि.मं
३. मा. प्राचार्य, सर्व औषधनिर्माणशास्त्र महाविद्यालये
४. मा. संचालक, सर्व मान्यताप्राप्त संस्था
५. मा. परीक्षा नियंत्रक, सा. फु. पुणे विद्यापीठ
६. मा. संचालक, स्पर्धा परीक्षा केंद्र
७. मा. उपकुलसचिव, परीक्षा (१,२)
८. मा. सिस्टीम ॲनालिस्ट डेटा प्रोग्रेसिंग युनिट
९. मा. उपकुलसचिव, नियोजन व विकास
१०. मा. उपकुलसचिव, (पात्रता विभाग)
११. मा. उपकुलसचिव (सभा दप्तर)
१२. मा. संचालक (परदेशी विद्यार्थी केंद्र)
१३. सहायक कुलसचिव, शैक्षणिक प्रवेश विभाग
१४. सहायक कुलसचिव (गोपनीय कक्ष)
१५. सहायक कुलसचिव (परीक्षा—एस.ॲण्ड टी. विभाग)
१६. सहायक कुलसचिव (परीक्षा समन्वय)
१७. वरिष्ठ कायदा अधिकारी
१८. जनसंपर्क अधिकारी
१९. कक्षाधिकारी (बहि:स्थ)
२०. प्रमुख, विद्यापीठ उपकेंद्र : अहमदनगर, नाशिक.

व्हीसी टिपणी क्र. २५२३ दिनांक २३/०६/२०१६

सावित्रीबाई फुले पुणे विद्यापीठ

(पूर्वीचे पुणे विद्यापीठ)

दूरध्वनी क्रमांक :
०२०—२५६९१२३३
२५६०१२५८
२५६०१२५९

शैक्षणिक विभाग
गणेशखिंड, पुणे—४११ ००७
टेलिग्राफ : 'युनिपुणे'
फॅक्स : ०२०—२५६९१२३३
वेबसाइट : www.unipune.ac.in
इ—मेल : boards@pun.unipune.ac.in

संदर्भ क्र. :सी.बी./फार्म./ ३६७

दिनांक : २७/०५/२०१७

परिपत्रक क्रमांक. १२२ /२०१७

विषय :— विज्ञान आणि तंत्रज्ञान विद्याशाखेअंतर्गत औषधनिर्माणशास्त्र तृतीय वर्ष व चतुर्थ वर्ष बी. फार्म. श्रेयांकपध्दती (२०१५ कोर्स) अभ्यासक्रमाबाबत....

विद्यापीठ अधिकार मंडळाने घेतलेल्या निर्णयानुसार सर्व संबंधितांस या परिपत्रकाद्वारे कळविण्यात येते की, विज्ञान आणि तंत्रज्ञान विद्याशाखेअंतर्गत औषधनिर्माणशास्त्र तृतीय वर्ष बी. फार्म. श्रेयांक पध्दती (२०१५ कोर्स) अभ्यासक्रमास शैक्षणिक वर्ष २०१७—१८ पासून व चतुर्थ वर्ष बी. फार्म. श्रेयांक पध्दती (२०१५ कोर्स) अभ्यासक्रमास शैक्षणिक वर्ष २०१८—१९ पासून मान्यता देण्यात येत आहे.

सदर अभ्यासक्रम सावित्रीबाई फुले पुणे विद्यापीठाच्या www.unipune.ac.in या वेबसाईटवर Syllabi – Pharmacy या शीर्षकाखाली उपलब्ध आहे.

सावित्रीबाई फुले पुणे विद्यापीठाच्या सर्व संलग्न औषधनिर्माणशास्त्र महाविद्यालयांचे मा. प्राचार्य यांना विनंती की, सदर परिपत्रकाचा आशय सर्व सबंधित प्राध्यापक व विद्यार्थ्यांच्या निदर्शनास आणून द्यावा.

२७/५/१७

उपकुलसचिव
(शैक्षणिक विभाग)

कृ. मा. प.

प्रत माहितीसाठी व पुढील योग्य त्या कार्यवाहीसाठी:—

१. मा. अधिष्ठाता, अभियांत्रिकी विद्याशाखा
२. मा. प्राचार्य, सर्व अभियांत्रिकी महाविद्यालये
३. मा. संचालक, सर्व मान्यताप्राप्त संस्था
४. मा. संचालक, परीक्षा व मूल्यमापन मंडळ, सा. फु. पुणे विद्यापीठ
५. मा. संचालक, स्पर्धा परीक्षा केंद्र
६. मा. उपकुलसचिव, परीक्षा (१,२)
७. मा. सिस्टीम ॲनालिस्ट डेटा प्रोग्रेसिंग युनिट
८. मा. उपकुलसचिव, नियोजन व विकास
९. मा. उपकुलसचिव, (शैक्षणिक पात्रता विभाग)
१०. मा. उपकुलसचिव (सभा व दप्तर)
११. मा. संचालक (आंतरराष्ट्रीय केंद्र)
१२. सहायक कुलसचिव, शैक्षणिक प्रवेश विभाग
१३. सहायक कुलसचिव (गोपनीय कक्ष)
१४. सहायक कुलसचिव (परीक्षा—एस.ॲण्ड टी. विभाग)
१५. सहायक कुलसचिव (परीक्षा समन्वय)
१६. वरिष्ठ कायदा अधिकारी
१७. जनसंपर्क अधिकारी
१८. कक्षाधिकारी (बहि:स्थ)
१९. प्रमुख, विद्यापीठ उपकेंद्र : अहमदनगर, नाशिक.

वि.प. ठराव क्र. ब २३ पीए/२३/२०१७, दि. २६ एप्रिल, २०१७