UNIVERSITY OF HYDERABAD

O/o the Controller of Examinations
Date: 4th August, 2017

REVISED NOTIFICATION

Sub: Introduction of Choice Based Credit System (CBCS)-Continuous Assessment System for Post Graduate courses from the academic year 2017-18.

Ref: 1) This office Notification of even no, dated 11-5-2015.
2) Proceedings of the 74th Academic Council meeting held on 15-4-2015 & 21-4-2015.
3) Vice-Chancellor's approval dated 22-6-2017, 17-7-2017 and 4-8-17

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As emphasized by the University Grants Commission, the University of Hyderabad has decided to implement the full version of Choice Based Credit System (CBCS)-Continuous Assessment System to provide greater academic autonomy to the University Departments of studies from the academic year 2017-18. Accordingly, the regulations for Choice Based Credit System (CBCS)-Continuous Assessment System has been approved by the 74th Academic Council meeting held on 15-4-2015 & 21-4-2015 and the decision was endorsed by the 165th Executive Council meeting held on 29-6-2015.

The existing Choice Based Credit System (CBCS) will however continue for All Schools/Departments/Centres.

NOTE: The above Choice Based Credit System (CBCS)-Continuous Assessment System is uploaded on the University Website.

Sd/-
Controller of Examinations

REGULATIONS FOR
CHOICE BASED CREDIT SYSTEM (CBCS)
AND CONTINUOUS ASSESSMENT SYSTEM
FOR POSTGRADUATE DEGREE PROGRAMMES IN THE UNIVERSITY
SCHOOLS/DEPARTMENTS/CENTRES WITH EFFECT FROM 2017-18

1. **Title and Commencement**–: These Regulations shall be called the University of Hyderabad Regulations for Choice Based Credit System (CBCS) and Continuous Assessment System for Postgraduate Degree Programmes. These Regulations shall come into force from the academic year 2017-2018.

2. **Programmes offered** : The Masters Courses approved by the Academic Council on the recommendations of various School Boards and Departmental Committees from time to time.

3. **Definitions:**

Academic Unit (AU): A School/ Department/ Centre of study is designated as an Academic Unit.

Academic Year: Two consecutive (one odd + one even) semesters constitute one academic year, i.e, 1st July of a calendar year to 30th June of the succeeding calendar year.

Choice Based Credit System (CBCS): The CBCS provides choice for students to select from the prescribed minimum number of credits to be completed by the students.

Course: Usually referred to, as 'papers' is a component of a programme. All courses need not carry the same weight. The courses should define learning objectives and learning outcomes. A course may be designed to comprise lectures/ tutorials/laboratory work/ field work/ outreach activities/ project work/ vocational training/viva/ seminars/ term papers/assignments/ presentations/ self-study etc. or a combination of some of these.

Credit Based Semester System (CBSS): Under the CBCS, the requirement for awarding a degree or diploma or certificate is prescribed in terms of minimum number of credits to be completed by the students.

Credit Point: It is the product of grade point and number of credits for a course.

Credit: A unit by which the course work is measured. It determines the number of hours of instructions required per week. One credit is equivalent to one hour of teaching (lecture or tutorial) or two hours of practical work/field work per week.

Cumulative Grade Point Average (CGPA): It is a measure of overall cumulative performance of a student over all semesters completed up to the end of a given semester. The CGPA is the ratio of total credit points secured by a student in various courses in all these semesters and the sum of the total credits of all courses in all these semesters. It is expressed up to two decimal places.

End-of-Semester Examination: Examination to be conducted at the end of the semester.

Grade Point: It is a numerical weight allotted to each letter grade on a 10-point scale.

Letter Grade: It is an index of the performance of students in a said course. Grades are denoted by letters A+, A, B+, B, C, D and F.

Minor: An assessment of student progress in a course before the end of the semester, Minors are to be conducted periodically during a semester at regular intervals and may consist of written exam, quiz, term paper, assignment, seminar presentation etc.

Programme: An educational programme leading to award of a Degree, diploma or certificate.

Semester Grade Point Average (SGPA): It is a measure of performance of work done in a semester. It is ratio of total credit points secured by a student in various courses registered in a semester and the total course credits taken during that semester. It is expressed up to two decimal places.

Semester: Each semester consists of 15-18 weeks of academic work equivalent to 90 actual teaching days. The odd semester may be scheduled from July to December and even semester from January to June.

Transcript or Grade Card or Certificate: Based on the grades earned, a grade certificate shall be issued to all the registered students after every semester. The grade certificate will display the course details (code, title, number of credits, grade secured) along with SGPA of that semester and CGPA earned till that semester.

Core Course: This is a course which is to be compulsorily studied by a student as a core requirement to complete the requirement of a programme in a said discipline of study.

Elective Course: Elective course is a course which can be chosen from a pool of courses. It may be:

- Supportive to the discipline of study
- Providing an expanded scope
- Enabling an exposure to some other discipline/domain
- Nurturing student's proficiency/skill.

An elective may be "Generic Elective" focusing on those courses which add generic proficiency to the students. An elective may be "Discipline centric" or may be chosen from an unrelated discipline to be called an "Open Elective

Foundation Course: The Foundation Courses are the courses based upon the content that leads to Knowledge enhancement. They are mandatory for all disciplines.

Every course offered will have three components associated with the teaching-learning process of the course, namely (i) Lecture (L) (ii) Tutorial (T) and (iii) Practicals (P).

The Tutorial session constitutes participatory discussion / self-study/ desk work/ brief seminar presentations by students and such other novel methods that make a student to absorb and assimilate more effectively the contents delivered in the Lecture classes. Practical / Practice session consists of Hands on experience / Laboratory Experiments / Field Studies / Case studies that equip students to acquire the much required skill component.

A course shall have either some or all the three components. That means, a course may have only lecture component, or only practical component or combination of any two or all the three components.

In terms of credits, every one hour session of L or T per week amounts to 1 credit per semester and a minimum of two hour session per week of P amounts to 1 credit per semester, with one semester generally running 16 weeks of teaching-learning process. The total duration of a semester is 20 weeks inclusive of semester-end examination.

The total credits earned by a student at the end of the semester upon successfully completing a course are L + T + P, where L is lecture credits; T, tutorial credits and P, practical credits. The credit pattern of the course is indicated as L: T: P. If a course is of 4 credits then the different credit distribution patterns in L : T : P format could be

4 : 0 : 0, 1 : 2 : 1, 1 : 1 : 2, 1 : 0 : 3, 1 : 3 : 0,
2 : 1 : 1, 2 : 2 : 0, 2 : 0 : 2, 3 : 1 : 0, 3 : 0 : 1,
0 : 2 : 2, 0 : 4 : 0, 0 : 0 : 4, 0 : 1 : 3, 0 : 3 : 1,

The concerned School Board will choose the convenient credit pattern for every course based on the requirement. Generally, a course could be of 2 to 4 total (L+T+P) credits.

Every course of study is categorized into one of the three groups namely, Foundation course, core course or Elective course.

A programme of study may also have a Project component.

4. Eligibility for admission

The candidates for various courses will be admitted based on the eligibility criteria as mentioned in the prospectus of the University.

5. Scheme of Instructions

5.1 A Masters Degree programme generally is of 4 semesters (two years duration) course except for MCA and MPA Theatre Arts (for which normal duration is 6 semesters or 3 years). A candidate can avail a maximum duration of N + 2 years (in one stretch) to complete Masters Degree (including idle semesters, if any), where N is the Normal duration of the programme in years. The course durations for all the courses has been provided in the prospectus of the University.

5.2 A candidate has to earn a minimum of credits as prescribed by the respective Academic Unit for successful completion of a Master's Degree with a distribution of credits for different courses as given in the following table.

The Course Structure as per CBCS would be as follows

Course	**Total (Credits)**
Two Foundation courses (to be offered for I & II semesters) each of 3/ 4 credits	06 (minimum)
Core courses	64 (minimum)
Electives	
Total	**70** (minimum)

a) The entire course structure will be categorized into Foundation, Core and Elective Courses.
b) The total number of credits may vary from one Academic unit to another for various courses, however, the minimum credits for the PG programme should be at least 70.
c) The Choice Based Credit System shall apply to all Integrated and PG students joining the university from 2017-18 batch and shall not apply to the ongoing students (including the students of the integrated programmes joining their host departments/schools).
d) The Choice Based Credit System shall not apply to M.Tech, M.Phil and PhD students.
e) The foundation courses may be of 3/ 4 credits.
f) Every student has to take at least two foundation courses in the 1st and 2nd semester from within or outside the Academic Unit as per the choice of the student.
g) All Foundation courses shall be offered in the time slot of 8 am to 9 am or 6 pm to 7 pm.
h) The course codes for all the Foundation courses shall be prefixed with FN
i) The ceiling in number of students for each foundation course offered will be 100
j) Every Foundation course is open to all students of Integrated and PG courses.
k) If the Foundation course offered is also a core course of the Academic unit then Foundation course shall be taught separately during the time slot of 8 am to 9 am or 6 pm to 7 pm and shall be of 3 credits.
l) All Integrated and PG students will do course registration for a Foundation course from the list of courses offered during this semester as per the schedule to be announced by the e-governance team.
m) Commencement of all Foundation courses shall be tentatively from 10th August 2017.
n) After the course registration by students is over the Centre Time Table committee shall inform the time and venue of each Foundation course.
o) All courses other than foundation courses shall be scheduled between 9.30 hours and 17.30 hours to facilitate student/teacher movement.
p) The College of Integrated Studies also will follow similar pattern and come up with the course structure.

5.3 The Academic Unit should encourage students to register for maximum credits in each semester to help them to broaden their scope of learning.

5.4 Only such candidates who register for a minimum credits in every semester (as decided by the respective Academic Unit) and complete the minimum credits

required in 4/6 successive semesters successfully shall be considered for declaration of ranks, medals and are eligible to apply for student fellowship, scholarship, and free ships.

6.0 Continuous Assessment, Earning of Credits and Award of Grades

The evaluation of the candidate shall be based on continuous assessment. The guidelines for continuous assessment for PG courses are evolved by their respective Boards of Study.

The period of internal assessment (Minors) is split into 3 components : C1, C2, and C3 and the end- semester assessment is represented as the last component C4. The end-semester assessment is for 60%. Each minor is for 20%. The best two minors (totaling 40%) are to be included in the total assessment.

6.1 The timeframe for semester duration would be as per the Academic Calendar approved by the Academic Council.

6.2 A candidate should have a minimum of 75% attendance in each course. However, the Deans of the respective Schools can allow exemption up to a maximum 5% for valid reasons including medical issues.

6.3 An assessment component may be written test/quiz/problem solving / practical - assignment/ mini-project work / case-study / assignment / seminar / term paper / review-test based etc. The guidelines may be worked out by the respective Academic Units. The performance of the learner in each minor should be made known to the learner within a fortnight from the date of test. The three continuous assessments have to be at regular intervals and distributed over the semester.

6.4 Assessment Norms, Question Papers and Evaluation

The Departmental Committee/the School Board of an Academic Unit will have a supervisory role in the choice of assessment pattern and the setting of the question paper. Any observations by the Departmental Committee / School Board have to be addressed by the concerned teacher(s).

At the end of the semester, the Academic Unit shall collect the student feedback on each course.

6.4.1 In case a candidate secures less than 40% marks in a course after the end-semester exam, the candidate is said to have FAILED in that course. The candidate may appear for supplementary examination. A student having failed in the supplementary examination or not appearing in the supplementary examination after having failed in the course, shall be required to repeat the course. In case of an elective course, the student may repeat the same course or an alternative course of equal credits.

6.4.2 **Improvement examination**

i) Students securing 'D' grade in the course of a semester may be allowed to improve their marks in one course in a semester. Appearance at such an examination in the course will be allowed only once. No further chance will be given under any circumstances.

ii) The improvement examinations will be conducted along with the supplementary examinations within a week of the commencement of the teaching of the next semester or as per the schedule prescribed.

iii) For the purpose of determining the Division, the better of the two performances in the examinations will be taken into consideration.

iv) The facility for improvement shall be open to all those who want to improve their grade irrespective of the CGPA obtained by them in the examination concerned. However, one should clear all courses of a particular semester in which he/she intends to take an improvement examination.

6.4.3 **Supplementary Examinations**: Students who are permitted to appear in supplementary examinations in course/s in accordance with clauses 5(a) of Teaching and Evaluation Regulations, and will be required to apply to write the examination concerned in the prescribed form and pay the prescribed examination fee by the date prescribed for the purpose by the University.

6.4.4 Special Supplementary Examinations: The PG and 5year Integrated PG students who after completion of the prescribed duration of the course are left with backlogs are eligible to appear for special supplementary exams subject to a maximum of two courses where number of courses in a semester are four and a maximum of three courses where the number of courses in a semester are more than four. Appearance in such exams shall be allowed only once.

6.4.5 Readmission: Students who are not found eligible to take semester examinations and also those who are not promoted to the next semester of the course may be considered for readmission to the concerned semester of the immediately following academic year. Such students should seek readmission before the commencement of the classes for the concerned semester or within a week of the commencement of the concerned semester if they are appearing in the supplementary examinations.

6.4.6 **APPEAL / GRIEVANCE**

A student can appeal to the Dean of the School for revaluation of C4 (end-semester exams) scores within **15** days of the announcement of results or the scheduled commencement of classes, whichever is later. The Dean of the School, shall constitute a Committee to look into the end-semester scripts of the student and send the recommendations of the Committee to the Controller of Examinations.

6.5 Project Evaluation

The Academic Unit of the University will decide the mode of evaluating the progress of the student and the allotment of weightages to different components. This has to be notified to the students before the commencement of the project.

6.6 An Academic Unit will forward the results of all students pursuing the courses in terms of grades obtained after adding internals and end-semester exam to the office of the Controller of Examinations for notifying the results.

6.7 The grade sheet will be issued by the office of the Controller of Examinations at the end of every semester indicating the courses completed successfully.

6.8 Upon successful completion of Master's Degree, a provisional certificate consisting of grades of all courses will be issued by the office of the Controller of Examinations.

6.9 The grade and the grade point earned by the candidate in the course will be as per the conversion formula of the respective Academic Unit.

6.10 Overall cumulative grade point average (CGPA) of a candidate after successful completion of the required number of credits as per the requirement of the programme and as approved by respective School Board is given by

$$\text{CGPA} = \frac{\text{Sum of all Credit Points}}{\text{Total number of credits}}$$

The CGPA to Percentage conversion table can be seen at:
http://acad.uohyd.ac.in/downloads/ConversinoChart.PDF

7. Classification of results

The final Qualitative Index to be awarded to the student is based on CGPA secured by the candidate and is given as follows.

CGPA	**Qualitative Index**
5 <= CGPA <= 6.49	SECOND CLASS
6.5 <= CGPA <= 7.99	FIRST CLASS
8 <= CGPA <=10	FIRST CLASS WITH DISTINCTION

8. In case there is any issue not addressed in these regulations, the decision of Vice-Chancellor on the advice of the School Boards/Academic Council shall be final. In emergency situation(s) the Vice Chancellor will take a decision in consultation with the Head and/or Dean, whichever is relevant.

Courses offered under CBCS by all the Schools for the July- Dec-17 Semester

Sl. No.	Name of the School	Foundation courses (3 Credits) except *	
		Title	Course code
1.	Computer information Sciences	Information Technology-I	FN 101
2.	Mathematics & Statistics	1. Bridge Mathematics	FN102
		2. Discrete Mathematical Structures *	FN103
		3. Elements of Probability & Statistics *	FN104
3.	Physics	How Things work, The Physics of Everyday Life	FN105
4.	Chemistry	Symmetry and Mathematics	FN106
5.	Life Sciences	Foundation Biology	FN107
		Basics of Maths & Statistics	FN108
6.	Humanities	Introduction to Ethics	FN109
		How Language Works	FN110
		Literature and the Margins	FN111
7.	Social Sciences	Indian Constitution	FN112
8.	S.N. School of Arts & Communication	Overview of Indian Dance and Theatre Forms	FN113
9.	Management Studies	Introduction to Management	FN114
		Principles of Analytical Ability & Logical Reasoning	FN115
10.	Medical Sciences	Introduction to Public Health	FN116
11.	Engineering Science & Tech.	Concepts of Nanoscience and Engineering	FN117

*----- 4 Credits

The Foundation courses offered by School of Mathematics and Statistics is open to following:

1. All Schools except to PG students of Schools of Math & Stat, Physics, Chemistry, SEST, SCIS and CIS students opting for MM102 course.
2. All Schools except to M.Sc. Math/ Appl. Math. Students and CIS students
3. All Schools except to M.Sc. Stat students and CIS students

School: Computer and Information Sciences
IT-I (Old Number: IT101 (New Number FN101)
Course Title: Introduction to Information Technology
Number of Credits: 2
Course Code No: FN 101

Type of Course: Lab Course (Both Windows + Linux) Number of Credits: 2 (3 hrs contact with the faculty)

This course will introduce the student to some of the productivity tools as well as Linux operating system. The following are the modules to be taught in the course:

1. MSOFFICE: Focus is on teaching how to use Office suite properly.
    a. MSWord: The following features are explored for MSWord
        i. Templates Using existing templates and creating new templates,
        ii. Complex Tables, Use of Pictures with text flowing around the picture, Sectioning, Captioning, Cross Referencing, Table of Contents, iii. Using Equation editor for complex equations, Multiple Column format documents.
    b. MSExcel: Using complex equations for combining data, VLOOKUP function, Excel charts, Excel Sort, Excel Filter, Pivot Table.
    c. MSPowerPoint: Using Animations and Transitions.
2. Linux: Basic commands in Linux such as listing files, viewing contents in files, creating and deleting directories, moving and copying files and/or directories, man pages, pipes, ps and top commands, killing processes. Basic philosophy of the Unix operating system's view of access rights on files/directories, setting permissions on files/directories, vi/emacs editors.
3. Latex: Understanding how to use latex for document preparation - exploring the same features as in MSWord.
4. Beamer: Understanding how to do slides with beamer and use some of the features of beamer.
5. gnuplot: Given data files, understanding how to use gnuplot to draw different types of graphs as in Excel.
6. Xfig: Understanding how to draw pictures using Xfig.

References:

1. Online Resources for MSOffice.
2. Linux manual pages and help documentation for gnuplot and Xfig.
3. A Document Preparation System: LATEX: User's Guide and Reference Manual: Leslie Lamport, Pearson Education.

4. Linux in a Nutshell, 6th Edition, Ellen Siever, Stephen Figgins, Robert Love, Arnold Robbins, O'Reilly.
5. The Linux Command Line, A Complete Introduction: William E. Shotts Jr., O'Reilly.
6. Beamer: http://www.tex.ac.uk/CTAN/macros/latex/contrib/beamer/doc/beameruserguide.pdf
7. Beamer Tutorial in Beamer: http://www.uncg.edu/cmp/reu/presentations/CharlesBattsBeamerTutorial.pdf

School: Mathematics & Statistics

Courses offered under CBCS

S No.	Name of the School	Foundation courses			Open to	Open elective courses			Open to
		Title /credits/ Time Slot/ Name of the Instructor	**Course code**	**Semester**		**Title /credits Students allowed (Wn.Sch. +oth.sch)* =total**	Course code	**Semester Time slot required**	
1.	Mathematics & Statistics	Bridge Mathematics (3 credits) [6pm-7pm] **Ms. Priya Das** (Temp. Faculty)	FN102	odd	All Schools except to PG students of Schools of Math & Stat, Physics, Chemistry, SEST, SCIS	Elements of Prob. & Stat. (4 credits) 25 + 60 from other academic units at PG level (9am to 10am)	ST 405	Odd	SP, SC, SLS, SE, S.Med. Sci., SCIS, SEST *[except to M.Sc. Stat. students of SMS and those who have done this course (FNSMS102 B) as a foundation course]*
2.		Discrete Mathematical Structures (4 credits) [8am-9am] **Dr. T. Sengupta**	FN103	odd	All Schools except to M.Sc. Math/ Appl. Math. Students				
3.		Elements of Probability & Statistics (4 credits) [6pm-7pm] **Dr. R.R.L. Kantam** (Guest Faculty)	FN104	odd	All Schools except to M.Sc. Stat students				

FN 102 BRIDGE COURSE-MATHEMATICS

I. ALGEBRA

Binomial theorem, General term, Middle term, problems based on these concepts Permutations and combinations Sequences and series (Progressions.)

Matrices (2x2 and 3x3 matrices); Determinant and Inverse of a Matrix, system of linear equations and their solution, Eigen values.

Mathematical Induction.

II. CO ORDINATE GEOMETRY (Two Dimensional Geometry)

1. Coordinate system: Distance formula, section formula, area of Triangle…etc.,
2. Straight Lines, angle between two lines, concurrent lines ,distance between two lines.
3. Conic Section.

III. TRIGONOMETRY

1. Introduction to Trigonometric ratios, [proof of sin(A+B), cos(A±B), tan(A±B)… formulae]
2. Multiple and sub multiple angles, sin2A, cos2A,tan 2A ….etc..,
3. Transformations. Sum into product and product in to sum formulae, problems.
4. Sine rule and Cosine Rule

IV. CALCULUS

1. Limits. Standard formulae, and problems
2. Differentiation: First principle, UV rule, U/V rule, Methods of Differentiation.
3. Applications of Derivatives
4. Integration, methods of integration, product rule, Substitution method.

References

1. NCERT class IX and XII text books.
2. Any state board mathematics test books of class XI and XII

FN 103 Discrete Mathematical Structures

Sets and propositions: Introduction, combinations of sets, finite and infinite sets, uncountably infinite sets, mathematical induction, principle of inclusion and exclusion, pigeonhole principle, multisets.

Statement calculus, truth tables, validity, consequence.

Predicate calculus: Propositional logic, propositional equivalence, predicates and quantifiers, rules of inference, proof of methods.

Permutations, combinations: Introduction, the rules of sum and product, permutations, combinations, generation of permutations and combinations.

Relations and functions: Introduction, properties of binary relations, equivalence relation and partitions, partial ordered relations.

Groups and rings: Introduction, semi-groups, groups, subgroups, generators and evaluation of powers, cosets and Lagrange's theorem, permutation groups, normal sub-groups, quotient groups,

group homomorphisms, automorphisms, isomorphisms, fundamental theorems of group homomorphisms, Cayley's theorem, group actions, Burnside's theorem.
Sylow's first, second and third theorems and their applications, structure theorem for finite abelian groups, composition series Jordan-Holder theorem, nilpotent and solvable groups.

References

[1] Liu, C., Elements of Discrete Mathematics, McGraw-Hill Education (India) Pvt Limited, 2008.
[2] Tremblay, J. P. and Manohar, R., Discrete Mathematics Structures with Applications to Computer Science, McGraw Hill, 1997.
[3] Rosen, K. H., Discrete Mathematics and Its Applications, sixth edition, Tata Mc-Graw Hill Education, New Delhi, 2008.
[4] Grimaldi, Ralph P., Discrete and Combinatorial Mathematics, fifth edition, Pearson Education, New Delhi, 2005.
[5] Kolman, B.; Busby, R. C. and Ross, S., Discrete Mathematics, fifth edition, Prentice Hall, 1996.
[6] Gossett, Eric, Discrete Mathematics with Proof, second edition, Wiley India Pvt. Ltd, 2009.
[7] Koshy, Thomas, Discrete Mathematics and Applications, second edition, Elsevier Publication, New Delhi, 2003.
[8] Mott, J. L.; Candell, A. and Bekar, I., Discrete Mathematics for Computer Scientists and Mathematicians, PHI, 1986.

FN 104 ELEMENTS OF PROBABILITY AND STATISTICS

Random experiments, sample spaces, sets, events, algebras; elements of combinatorial analysis; classical defiinition and calculation of probability, independence of events.

Random variables, distribution functions, moments, probability and moment generating functions, independence of random variables, inequalities.

Introduction to various discrete and continuous random variables, limiting distributions of some random variables, distributions of functions of random variables.

Bi-Variate distributions, conditional and marginal distributions, conditional expectation and variance, co-variance and correlation coefficient , bivariate moment generating functions.

Elementary understanding of data: frequency curves, empirical measures of location, spread, empirical moments, analysis of bivariate data; fitting of distributions.
Sampling distributions, Chi-square, t, F.

References

[1] Feller, W., Introduction to Probability Theory and its Applications, third edition, Wiley Eastern, 1978.
[2] Ross, S., A First Course in Probability, sixth edition, Pearson Education, 2007.
[3] Prakasa Rao, B. L. S., A First Course in Probability and Statistics, World Scientific, 2009.

School: Physics
Syllabus for Foundation course
Number of Credits:
Course Code No: FN105

(PY001): HOW THINGS WORK? THE PHYSICS OF EVERYDAY LIFE MECHANICS.

TOPIC 1

Module 1.

1.1 Skating

(inertia,force,velocity,acceleration ,mass,Newton's first and second laws, inertial frames of reference,units)

1.2 Falling Balls

(weight,projectile motion,vector components)

1.3 Ramps

(*net force,Newton's third law ,energy,work,energy conservation,potential energy,ramps,mechanical advantage)*

Module 2. Mechanical Objects

2.1 Bicycles

(unstable equilibrium,static and dynamic stability,precession)

2.2 Rockets and Space Travel

(reaction forces,Newton's law of gravitation,elliptical orbits,Kepler's laws,special and general relativity,equivalence principle)

Module 3. Fluids and Motion

3.1 Garden Watering

(viscous forces,laminar and turbulent flows ,speed and pressure in a fluid,Reynolds number,chaos,momentum in a fluid)

1.2 **Balls and Air**

(aerodynamic lift and drag,viscous drag,pressure drag,boundary layers,Magnus and wake deflection forces)

3.3 Airplanes *(streamlining,lifting wing,angle of attack,induced drag,stalled wing,thrust)*

Module 4. Thermodynamics

4.1 Water,Steam and Ice

(phases of matter,phase transitions,melting,freezing,condensation,evaporation,relative humidity,latent heats of melting and evaporation,sublimation,deposition,boiling,nucleation, superheating)

4.2 Air Conditioners

(laws of thermodynamics,temperature,heat,entropy,heat pumps and thermodynamic efficiency)

4.3 Automobiles

(heat engines and thermodynamic efficiency)

Module 5. Waves and Oscillations

5.1 Clocks

(time and space,natural resonance,harmonic Oscillators,simple harmonic motion,frequency)

5.2 Musical Instruments

(sound,music,vibrations in strings,air and surfaces,higher-Order modes,harmonic and non- harmonic overtones,sympathetic vibration,standing and traveling waves,transverse and longitudinal waves,velocity,frequency and wavelength in mechanical waves , superposition,Doppler effect)

Module 6. Magnetism and Electrodynamics

6.1 Household Magnets

(magnetic pole,magnetostatic forces,Coulomb's law for magnetism ,magnetic fields,ferrromagnetism,magnetic polarization ,magnetic domains,magnetic materials,magnetic flux lines,relationship between currents and magnetic fields)

6.2 Electric Power Distribution

(superconductivity, direct and alternating currents induction,transformers,magnetic field energy,relationship between changing magnetic fields and electric fields,induced emf,Lenz's law,electrical safety)

6.3 Electric Generators and Motors

(electromagnetic forces ,energy and work,Lorenz force)

Module 7. Electronics

7.1 Power Adapters

(quantum physics,wave-particle duality,Pauli exclusion principle,band structure,Fermi level,metals ,insulators and semiconductors,p-n junction,diodes,capacitors)

7.2 Audio Players

(analog vs.digital representations,resistors,MOSFETs,logic lements,series and parallel circuits ,amplifiers)

Module 8. Electromagnetic Waves

8.1 Radio

(electric field energy,relationship between changing electric fields and magnetic fields,tank circuits,speed of light,wave polarization,amplitude modulation,frequency modulation,bandwidth)

8.2 Microwave Ovens

(speed,frequency and wavelength in electromagnetic waves,polar and nonpolar molecules,cycoltron motion)

Module 9. Light

9.1 Sunlight

(Rayleigh scattering,impedance,refraction,reflection,dispersion and interference in electromagnetic waves,index of refraction,polarized reflection)

9.2 Lasers and LEDs

(incoherent and coherent light,spontaneous and stimulated emission,population inversion,laser amplication and oscillation,diffraction,laser safety)

Module 10. Optics

10.1 Cameras

(refracting optics,converging lenses,real images,focus,focal lenghts, f-numbers ,the ens equation,diverging lenses,virtual images,light sensors,vision and vision correction)

10.2 Optical Recording and Communication

(diffraction limit,plane and circular polarization,total internal reflection)

Module 11. Modern Physics

11.1 Nuclear Weapons

(nuclear structure,isotopes,radioactivity,uncertainty principle,tunneling,half- life,alpha decay,fission,chain reaction,fusion,transmulation of elements fallout)

11.2 Medical Imaging and Radiation

(X-rays, gamma rays,X-ray fluorescence,Bremsstrahlung,photoelectric effect,Compton scattering,beta decay,anitimatter,accelerators,magnetic resonance)

Module 12: Physics Introduction

Text Book: " How Things Work"

Louis A BLOOMFIELD, 3rd Edition, John Wiley and Sons ,Accompanied by Walter E Lewin's YOU TUBE lectures.

School: Chemistry
Symmetry and Mathematics
Number of Credits: 3 credits
Course Code No:FN106
(Foundation Course)

Symmetry elements and operations, point groups. Matrix representation of symmetry operations-Great Orthogonality Theorem-Character tables. Direct product representations. Projection operators and symmetry adapted linear combinations. Applications to molecules.

Numbers: Real and complex number algebra. Vector algebra.

Functions and Variables : Differential calculus-first- and higher-order derivatives, evaluation of minimum and maximum, limits and continuity. Partial differentiations. Exact and inexact differentials. Numerical differentiation. The gamma and delta functions.

Integral Calculus: Indefinite and definite integrals, improper integrals. Methods of integration. Surface and volume integrals. Numerical integrations.

Differential Equations: Ordinary first- and second-order differential equations. Partial differential equations. Solution of inexact differential equations by the method of integrating factors. Power series and extended power series solutions. Numerical solutions.

Special Functions: Hermite, Legendre and Laguerre polynomials, recursion relations.

Matrices and Determinants. Eigenvalues and eigenvectors. Orthogonal transformation. Rank and inverse of a matrix.

Solution of Linear Systems: Gaussian elimination, Cramer's rule. Gauss-Jordan elimination. Gauss-Seidel and Jacobi methods.

Solution of Non-Linear Systems: Newton-Raphson method.

Curve fittings.

Probability and Statistics: Permutation and combination. Probability. Stirling's approximation. Lagrange multipliers.

School of Life Science
Foundation Biology
Number of Credits: 3 credits
Course Code No:FN107

Science of life and its chemical basis: introduction to what is life, how biology is studied and importance of studying biology (2hr).

Chemistry of life: importance of water, brief mention of macromolecules that make life forms (4hr). Nucleic acids and origin of life (4hr)

Brief introduction to microscopy: taking examples of a couple of structures as visualized by light microscopy to fluorescence to confocal to electron microscopy (2 hr)

Cells as units of life: Features of fundamental units of life, prokaryotic and eukaryotic cell, organization of prokaryotic cell, organelles in eukaryotes (nucleus, cytoplasm, mitochondria, lysosome, peroxisomes, endomembrane system, cytoskeleton, chloroplast, cell wall, extracellular matrix) (6)

Cell membranes: basic structures, specialization of membranes: adherence, selective permeability, active process of transport and communication between organelles, communication between cells and between cells and environment. Other specialized functions of membranes (8)

Cell communication and multicellularity: signals, signal receptors, response to signals (10)

Total credits: 36hr

Reference books

a) Life: The Science of Biology by Sadava et al
b) Biology by Raven and Johnson
c) Campbell's Introduction to Biology

Course Code: FN108/BT406 Basics of Mathematics & Statistics 3 Credits

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Unit I

Algebra

Linear equations, functions: slopes-intercepts, forms of two-variable linear equations; quadratic equations (solving, graphing, features of, interpreting quadratic models etc.), introduction to polynomials, graphs of binomials and polynomials; Symmetry of polynomial functions, basics of trigonometric functions, Pythagorean theory, graphing and constructing sinusoidal functions, imaginary numbers, complex numbers, adding-subtracting-multiplying complex numbers, basics of vectors, introduction to matrices; Operations on Matrices, Inverse of a Square Matrix, Determinant, Cramer's Method of Solutions; Eigenvector and Eigenvalues of as square matrix. Solutions by Iteration Methods: gauss Elimination Method and Gauss-Seidel Method.

Unit II

Geometry:

Cartesian, Polar and Cylindrical Coordinate systems; Analytical Geometry.

Calculus

Differential calculus (limits, derivatives), integral calculus (integrals, sequences and series etc.)

Unit III

Statistics

Basic probability, venn diagrams, dependent probability, conditional probability and Bayes' theorem, permutations and combinations, making decisions with probability, correlation & causality, tests of statistical significance, hypothesis testing & null hypothesis, two-way variables, mean/median/mode, variance and standard deviation, constructing box-plots, expected values with empirical probabilities, binomial distributions, Poisson processes, scatter plots, fitting quadratic and exponential functions to scatter plots, linear regression & correlation; normal distributions, chi-square probability distribution, analyses of variance, Bernoulli distributions and margin of errors, hypothesis testing with one sample, one-tailed and two-tailed tests, T-statistic confidence interval,F-test, One-way ANOVA. Non-parametric methods: Wilcoxson, Mann-Whitney, Kolmogorov-Smirnov and Kruskal-Wallis tests.

Unit IV

Mathematical models: Some examples from biological sciences

Population dynamics; oscillations, circadian rhythms, developmental patterns, symmetry in biological systems, fractal geometries, size-limits & scaling in biology, modeling chemical reaction networks and metabolic networks.

Recommended Textbooks and References:

1. Stroud, K. A., & Booth, D. J. (2009). *Foundation mathematics*. New York, NY: Palgrave Macmillan.
2. Billingsley, P. (1986). *Probability and measure*. New York: Wiley.
3. Rosner, B. (1986). *Fundamentals of biostatistics*. Boston, MA: Duxbury Press.
4. Daniel, W. W. (1987). *Biostatistics, a foundation for analysis in the health sciences*. New York: Wiley.
5. Pollard, J. H. (1977). *A handbook of numerical and statistical techniques with examples mainly from the life sciences*. Cambridge: Cambridge University Press.

School: Humanities
Department: Centre for Comparative Literature
Introduction to Ethics (Foundation Course)
Number of Credits:
Course Code No:FN109
Course Instructor: Anand V Wazalwar

This course introduces some basic concepts of the discipline Ethics, which will be of relevance to students of all disciplines, particularly to social sciences, humanities, law, business management and philosophy. Along with the historical evolution of the discipline, this course examines some important theoretical frameworks and analyses certain ethical challenges facing our society and humanity in general in the contemporary world. In this introduction to ethics, the philosophy of morality, we shall be considering questions of both practice (is lying wrong? Must we keep our promises?) and theory (what makes an action wrong? How do we apply moral theory to society?). We shall examine four important ethical theories namely, Aristotle's virtue ethics, Kant's deontology, Hume's expressivism and Mills utilitarianism. We shall apply them to two practical questions: the rights of animals and euthanasia. Besides providing familiarity with the primary questions addressed within moral philosophy and the most influential answer given by well-known philosophers, this course is designed to help students develop their abilities to read various ethical theories and arguments, and to explicate and analyze their own ethical positions and think critically and analytically about ethical issues.

The areas you will cover in this course are:

1. Nature and scope of ethics.
2. Freedom of will: Determinism Vs Indeterminism
3. Development of Morality: Instinctive, Customary and Rational Levels.
4. The Individual and Society: Egoism, Altruism and Universalism
5. Theories of Punishment: Retributive, Deterrent and Reformative

Suggested Readings:

1. *Ethics: A Very Short Introduction.*
   Simon Blackburn – 2001- Oxford University Press.
2. *An Introduction to Ethics*
   William Lillie – 1948 – Barnes & Noble
3. *New Studies in Ethics, Vol 1, Classical Theories*
   Ed. by Hudson – 1974 - Macmillan
4. *Ethics*

Peter Singer – 1994 – Oxford University Press

5. *An Introduction to Philosophical Analysis*
   John Hospers – 1996 – Prentice Hall

School: Humanities
Department: English
Course: HOW LANGUAGE WORKS
Instructor: Gopika Sankar U.
Number of Credits: 3
Course Code No:FN110

As something used every other moment in some form or the other, language is often taken for granted. Yet what come out as concrete utterances or scripted formations often spring from an abstraction that can hardly be defined. The very attempt to understand the phenomenon of language may thus unfold as a daunting process. However, there are certain tangible elements which make and break language or languages. The course attempts to explore how language is made to work through these elements.

Course objective: to understand how language works or how the abstract language is made to look concrete for the purpose of communication.
Language and other forms of communication (animal communication, non-verbal human communication) Origin and evolution of language—Origin of speech—Language changes—Language families (an overview)Speech communities—Language and region—Language and nation Language and Politics— How languages are born, bred, and how they die—Hegemony, Imperialism, Dominance of Languages in society Languages and social lives—Identities/ Differences created by Language Language relations, interdependence, and translation—The breakdown of language (when language does not 'work' or overworks) Language acquisition, learning *a* language and learning *about* Language

Orality, Literacy and Literature

Language skills—LSRW

Language in the digital era—Media, technology and language

Sign language (an overview)

Linguistic rights and responsibilities, order, decorum, license, censorship, embarrassment, etc.

Language and silence

NB: Case study: The case of English language will be used to elucidate language changes, language skills, influence of media, etc.

Discussion topic: Language and communication (will not be included for assessment).

Assessment

Continuous Assessment: 40%; End-semester examination: 60%.

Suggested Reading:

1. Charles Hockett. "The Origin of Speech." 1960. http://projects.illc.uva.nl/LaCo/CLAS/clc13/papers/hockett60sciam.pdf

2. David Crystal. *How Language Works: How Babies Babble, Words Change Meaning, and Languages Live or Die.* Penguin, 2007.

— *The Cambridge Encyclopaedia of The English Language*. Cambridge UP, 2010 (3rd ed), 2003 (2nd ed).

3. Keith Brown (Ed). *Encyclopedia of Language and Linguistics*. Elsevier, 2005.

(NB: Other texts may be incorporated as and when required).

School: Humanities
Department: Centre for Comparative Literature
Title of the Course: Literature and the Margins
Number of Credits:
Course Code No:FN111

This course is intended to familiarize the students with basic concepts of literature and important genres such as epic, drama, poetry and long and short fiction drawn from various language cultures in India in order to lay foundation in the subject. The syllabus components also include Bhakti poetry and Saivism as literary and religious movements. The issues of community, caste and religion, of disability or different ability, of gender and sexuality, of patriarchy and feminism, of homosexuality and the Dalit interface, will be some of the central concerns. Apart from this, the prescribed texts would focus on the issues of the peripheral categories of society from both colonial and post-colonial perspectives.

I. Literary Texts

A. Short Stories:
1. Premchand's *The Child* (Hindi)
2. Masti Venkkatesa Iyengar's *The Curd-Seller* (Kannada)
3. Shankarrao Kharat's *A Corpse in the Well* (Marathi)
4. Kolkaluri Enoch's *The Village Well* (Telugu)

B. Novel: (Extracts):
1. Mulk Raj Anand' *Untouchable*
2. Shashi Desh Pandey's *The Long Silence*
3. Manu Joseph's *Serious Man*

C. Bhakti Poetry: *Saivism*:
1. Manikka Vasahar, 2. Basavanna 3. Lalla

II. Critical Essays

Francis Bacon, *Advancement of Learning* (extract)
Matthew Arnold, *Culture and Anarchy*
Temsula Aao, *The Ao Naga Oral Tradition* (extracts)
Sharan Kumar Limbale, *Towards an Aesthetic of Dalit Literature* (extracts)
Howard Margolis and Arthur Shapiro, "Countering Negative Images of Disability in Classical Literature"
Paula Richman, *Many Ramayanas: The Diversity of a Narrative Tradition in South Asia* (extract)

III. Extracts from Life Writings

Ras Sundari Devi's *My Life*

Recommended Reading

Alphonso-Karkala, John B. ed., *An Anthology of Indian Literature.*
Dangle, Arjun, ed., "Dalit Literature: Past, Present and Future," in *Poisoned Bread*: *Translations from Modern Dalit Literature*.
Das, Sisir Kumar, *A History of Indian Literature, 1800-1910*.
Dasgupta, Sanjukta, "Introduction," *Adivasi and the Raj: Socio Economic Transition of the Hos, 1820-1932.*
Dutta, Nandhana, "Narrative Agency and Thinking about Conflicts."
Eleanor, Zelliot, *From Untouchable to Dalit: Essays on the Ambedkar Movement*.
Fanon, Fanon, "On National Culture."
Gramsci, Antonio, *Prison Notebooks*.
Hawley, John Stratton, *A Storm of Songs*: *India and the Idea of the Bhakthi Movement.*
Kaul, Suvir, ed., *Of Gardens and Graves*; *Essays on Kashmir, Poems in Translation.*
Klarer, Mario, *An Introduction to Literary Studies*.
Krishnamurthy, B.H and C. Vijayasree, eds., *Gold Nuggets: Selected Post-independence Telugu Short Stories*.
Manohar, Murali, ed., *Dalits and Religion*.
Pandey, Gyanendra, "Can a Muslim Be an Indian."
Rege, Sharmila, *Writing Caste/Writing Gender: Reading Dalit Women's Testimonies*.
Rushdie, Salman, *Imaginary Homelands*.
Said, Edward, *Orientalism*.
Sengupta, Rajarshi, *Rhyming Revolution, Studies in History*.
Tharu, Susie and K. Lalitha, eds., *Women Writing in India; 600 B.C. to the Present (Vol.1)*.
Tharu, Susie and Tejaswini Niranjana, "Problems for a Contemporary Theory of Gender."
Vishwanathan, Gauri, "Conversion to Equality," *Outside the Fold: Conversion, Modernity and Belief*.
Williams, Raymond, *Keywords*.

Course Requirements: Minimum 75% attendance in the class.

Internal Evaluation for 40 marks: best two out of student presentations, written tests and assignments. The internals will be spread-out over the semester and the topics for presentations and assignments are to be discussed and finalized at the beginning of the semester in consultation with the teacher/s concerned.
End Semester Examinations for 60 marks.

School: Social Sciences
Department: Political Science
Five Year Integrated M.A Programme in Political Science
Course Title: Indian Constitution
Semester –II
Number of Credits: 3
Course Code No: FN112
Lectures: 3 Session/Week

Course Objectives

The course introduces the students to the structure and the main provisions of Indian Constitution.

Content

1. **Making of the constitution**

    a. Constitutional reforms under colonial rule
    b. Constituent Assembly of India: Major debates (nation building, minority rights, right to property, federalism)

2. **Basic structure of the constitution**
    a. Preamble
    b. Fundamental rights
    c. Directive principles
    d. Federalism
    e. Secularism
    f. Judicial review

3. **Constitutional amendments**

4. **Constitutionalism and democracy in India**

Reading list

Austin, Granville (2013): *Indian constitution: The Cornerstone of a Nation*, New Delhi: OUP
Basu, D. D. (2007): *Introduction to the Constitution of India*, Nagpur: Wadhwa and Co.
Bhargava, Rajeev (ed.) (2009): Politics and Ethics of Indian Constitution, New Delhi: OUP
Chaube, Shibanikinkar (2000): *Consituent Assembly of India: The Springboard of a Revolution*, New Delhi: Manohar
Gupta, Sobhanlal Datta (1979): *Justice and Political Order India: An Inquiry Into the Institutions and Ideologies*, 1950-1972, New Delhi: K.P. Bacghi & Company.
Hardgrave, Robert L. and Stanley Kochaneck (2008): *India: Government and Politics in a Developing Nation*, Thomson: Wardsworth
Jayal, N.G and P.B. Mehta (eds.) (2012): The Oxford Companion to Politics in India, New Delhi: OUP Khosla, Madhav (2012): The Indian Constitution: Oxford India Short Introduction; New Delhi: OUP.

School: S. N. School of Arts and Communication
Department : Dance
Foundation Course: :Overview of Indian Dances and Theatre Forms
Course Code No: FN113
Number of Credits :

Brief introduction of the course/s: The Overview of Indian Dances and Theatre Forms fundamentally introduces the socio-cultural history of the various forms emerging in varied contexts.
Course objectives: To provide the students with an understanding of all Indian Classical dances and traditional theatre forms. A special interest is laid on the elements of commonalities and divergence amongst the various forms in terms of history, development, form, structure, technique, repertoire and gender. The following dance and theatre forms include the core study: Kuchipudi, Bharatanatyam, Kathakali, Mohinittam, Kathak, Odissi, Manipuri, Sattriya, Chau, Yakshagana, Ramaleela, Kudiattam, Bhagavata Mela.

Total no. of hours: 45

Content of topics and titles

1. Introduction to the contextual emergence of various forms with reference to multiple sources. (5 sessions)
2. Survey of Indian dances, geographical distribution and ethnography. (7 sessions)
3. Classification of the Indian dances in terms of Natya Mela and Nattuva Mela traditions. (6 sessions)
4. Patrons and performance – the role of court and temples as nurturing platforms. (6 sessions)
5. Indian Dances – common traits and diverging areas in terms of form, structure, technique, repertoire and gender. (8 sessions)
6. The salient features of dance drama traditions. (4 sessions)
7. Tradition and change in dance practices in the pre and post independent India. (4 sessions)

Name of the Faculty : Prof. Aruna Bhikshu

School of Management Studies
CBCS Course - Introduction to Management
Number of Credits: 3 credits
Course Coordinators: Dr. Sita Vanka, Dr. Sapna Singh & Dr. Punam Singh
Course Code No: FN114

Objective

This is a basic course, which aims at introducing the concept of management to the student. The meaning, importance, and the process of management is included, along with the principles and processes that govern management in an organizational context.

Unit- 1 - Management – Meaning, definition, and Concept of management. Importance and nature of management - Management as a Science or Art. Manager and Leader - Managerial Roles and Skills. Management Styles and Approaches – American, European and Japanese Style of Management.

Unit-2 - Evolution of Management Thought: Scientific Management, Human Relations and The Behavioural School.

Unit-3- Process of Management - Planning –The Planning Process, Principles of Planning, Types of Planning. Advantages and Limitations of Planning**.** Strategic Planning-An Overview

Unit-4 - Organizing- Organization Structure- Formal and Informal Organization- Line and Staff. Authority- Departmentalization - Span of Control- Centralization and Decentralization- Delegation of Authority. Directing and Communication – Barriers to Effective Communication.

Unit-5- Coordination & Control - Concept and Process of Coordination. Control, Control Techniques. Decision Making - Concept, Characteristics of Decisions, Types of Decisions, Importance of Decision Making.

Suggested Readings.

1. Robins, Coulter, De Cenzo (2016) *Fundamentals of Management*. New Delhi: Pearson Education India.
2. Robins, Coulter, Vohra (2009) – *Management*. New Delhi: Pearson Education India.
3. Koontz Harold & Weihrich Heinz (2008) – *Essentials of Management*. New York: Tata Mc Graw Hill.
4. Kreitner, Mohapatra (2008) *Management*, New Delhi: Biztantra Dreamtech Press.
5. Stoner, Freeman & Gilbert Jr (2003) *Management*. New Delhi: Pearson Education India.

School of Management Studies
CBCS Course - Principles of Analytical Ability & Logical Reasoning
Number of Credits: 3 credits
Course Code No: FN115

1. **Mathematical Ability**

- Number systems
- Permutation combination
- Probability
- Time and work
- Time and distance
- Profit and loss
- Differentiation and integration
- 1st and 2nd order ordinary differential equations
- Coordinate geometry
- Mensuration
- Linear algebra

2. **Data Analysis & Interpretation**

- Basic statistics
- Text and tables
- Graphs and charts
- Venn diagram

3. **Logical Reasoning & Mental Ability**

- Direction sense
- Clocks and calendars
- Puzzles
- Binary logic
- Seating arrangement
- Coding and decoding
- Blood relations
- Logical sequence
- Data structure
- Statements and conclusions

School: Medical Sciences
Course Title: Introduction to Public Health
Course Code No: FN116
Number of Credits:

Introduction to Public Health COURSE OVERVIEW

Public Health is a multidisciplinary field encompassing the theory and methods of the five core disciplines: biostatistics, environmental health, epidemiology, health management and policy, and social and behavioral sciences. Public health research and practice utilize and integrate across these disciplines to understand and respond to health issues and challenges at the population and community level. This course will introduce and examine the evolution of definitions and concepts in the understanding of public health. It will be a means for improving critical thinking to understand public health as an evolving, multifaceted practice. Through a series of lectures, readings, discussions, and historical documentaries, this course presents an introduction to the core disciplines and the history and philosophy of public health. Historical examples of important public health challenges will be used to illustrate the nature, role, and organization of the public health response. Faculty members will use current public health challenges to connect with the history of public health and to illustrate the integrative nature of the field. This course is taught through a combination of approaches: lectures and group discussions. The set of assigned readings and written assignments will broaden the student's understanding of topics covered in class and reinforce the concept of multidisciplinary integration in public health.

Introduction to Public Health is a Foundation course open for all schools in the University

LEARNING GOALS:
By the end of this course, students should be able to:

1. Describe key features of the historical development of public health, including the most important achievements of public health.

2. Identify and describe core functions of public health

3. Identify the role and contributions of each of the core disciplines in public health

4. Describe the various components of the national, state, and local public health systems.

5. Understand the difference between personal health and public health.

6. Understand the determinants of health from a global perspective, including environmental, social, cultural, behavioral, and biological factors.

7. Outline the concepts of prevention, detection, and control of infectious and chronic diseases.

8. Explain the most important public health problems and issues facing society, including health disparities, aging, injuries, obesity, control of emerging diseases, and emergency preparedness.

COURSE SCHEDULE

FN-116 Introduction to Public Health

Time 8.00 -9.00 am on Tuesdays and Fridays	Topic	Faculty member
18/08/17 Fri	Overview of public health disciplines and fields Relevance of Public Health	Dr. CTA
22/08/17 Tue	Epidemiological Triad – Agent, Host, Environment	Prof. GKV
29/08/17 Tue	Public health history, milestones, and accomplishments	Dr. SDP
1/09/17 Fri	Core public health functions and essential public health services	Dr. BRS
5/09/17 Tue	Universal Health Coverage (UHC) National Health Mission (NHM)	Dr. BRS
8/09/17 Fri	Community Eye Health	Dr. BRS
12/09/17 Tue	Internal Assessment-I	
15/09/17 Fri	Diet, exercise, tobacco, and alcohol as public health problems	Dr. CTA
19/09/17 Tue	Health system of India Health profile of India	Dr. SDP
22/09/17 Fri	Health care system contd., Health system reform	Dr. SDP
26/09/17 Tue	Functions and services of a PHC	Dr. CTA
3/10/17 Tue	Case study: Discussion on factors related to health system in general	Dr. SDP
6/10/17 Fri	Internal Assessment- II	
10/10/17 Tue	Lifestyle and chronic non-communicable disease	Dr. BRS
13/10/17 Fri	Social determinants of health	Dr. AK

17/10/17 Tue	Health disparities and vulnerable population	Dr. CTA
20/10/17 Fri	Discussion on factors having a bearing on the family –interplay of social and economic determinants.	Dr. AK
24/10/17 Tue	Public health disability (including injuries)	Dr. AK
27/10/17 Fri	Aging issues in public health	Dr. VM
31/10/17 Tue	Aging: Future threats and challenges health	Dr. VM
3/11/17	Internal Assessment-III	
7/11/17	Occupational health	Dr. SDP
10/11/17	Communicable diseases	Dr. AK
14/11/17	Gender and Health	Dr. VM
17/11/17	Mental health and public health Drug abuse and addiction as public health challenge	Dr.VM
	End term exam	

Prof. GKV– Prof. Geeta Vemuganti, Dr. CTA- C.T. Anitha, Dr. BRS- B.R. Shamanna, – Dr.AK- Ajitha Katta, Dr.VM-Varalakshmi Manchana, Dr. SDP- Surya Durga Prasad. Dr. RB- Rishi Bhardwaj

TEACHING METHODS

This course is comprised of lectures, class discussions, field visits, presentations, written assignments, and case studies.

Lectures

The instructors and guest speakers will conduct a series of lectures and facilitate class discussion on core areas of public health and pressing public health concerns. Regular class attendance and active participation in class discussions are essential for achieving a meaningful learning experience.

Field visits

Field visits are part of this course. Students will have to do a case study on one family and discuss factors having a bearing on their health and well-being with specific emphasis on the interplay of socio-cultural and economic factors influencing health. Material from field visit presentations will comprise 5-10% of the final exam.

Writing Assignments

Students will complete three assignments which build on material presented in the course. Specific instructions and guidelines will be provided in class, but briefly:

- The 2nd paper will be an essay on any public health issue/ program that involves public health core disciplines. The paper will be 2-3 pages in length and will require students to collect and incorporate information from a variety of public health sources.
- Presentation on the Field visit with a description of the mission, role and activities of PHC/ CHC/ local hospital engaged in public health practice.
- Case study/scenario will be given and the students are expected to discuss the preventive and control measures using the principles and elements of public health.
- The final exam will be an in-class exam.

GRADING CRITERIA AND ASSIGNMENTS

Three internal assessments would be conducted comprising 20 marks each. Best of two internal assessment marks (out of 40) would be considered for End term exam. The final theory paper would be out of 60 marks. Results would be based on combination of internal assessment (40 marks) and theory paper (60 marks) out of total 100 marks.

READINGS:

Park's Textbook of Preventive and Social Medicine

Mary-Jane Schneider, Introduction to Public Health, 2nd Ed... Jones and Bartlett, 2006.

Essentials of Public Heath - BJ Turnock. Jones & Bartlett, 2007

Oxford Textbook of Public Health, 4th edn

Maxcy's Textbook of Public Health.

Additional readings and reference websites will be provided throughout the semester.
Required readings will be assigned for individual lectures and sent via mail.

School: Engineering Science & Technology
Concepts of Nano- Science and Technology
Course Code No:FN117
Number of Credits:

Syllabus

Essence of Nano- Science and Technology (Why? What? When?; what to expect and what not to);

Nanomagnetism (A case study, history of nano- science and technology);
Magnetospirilium magneticum (Its billion years existence in relation to Nano- Science and Technology);

Movers and Shakers in Nano- Science and Technology (Eric Drexler, Taniguchi, Richard Feynman, etc.,); Contribution to Science and Related Technology (Ex: GMR effect and data storage devices);

Recognizing sizes; Things we already know at small length scales (Ribosome, Thylakoids, Keratin Hairs, DNA, Neurons, Polypyrole, Quantum mechanics, Limits to mathematical functions, Food, Ayurveda etc.,);

Interlude (Electrons, Atoms and Ions, Molecules, Metals, Other Materials, Biosystems, Molecular Recognition, Electrical Conduction and Ohm's Law, Quantum Mechanics and Quantum Ideas, Optics etc.,); Tools to make and measure "nano";

Importance of Quantum and Statistical Mechanics (simple examples);

Applications (Environment, Energy, Food, Disease etc.,)

Books:

1. "Nanotechnology: A Gentle Introduction to the Next Big Idea", M. Ratner and D. Ratner, Princeton Hall, (2002).

2. "Nanotechnology for Dummies" R. Booker and E. Boysen, Wiley Publishing Inc., (2005).

3. "Introduction to Nanoscience", S. M. Lindsay, Oxford University Press, (2010).