Shikshan Prasarak Sanstha`s

Padmabhushan Vasantraodada Patil Mahavidyalaya, Kavathe Mahankal

DEPARTMENT OF PHYSICAL EDUCATION

Mechanism for framing Learning Outcomes and Measuring their Attainment

Step 1: Defining the Vision and Mission of the Department.

Vision: To give all students opportunities and experiences that lead to the achievement of total wellness and result in a longer and healthier life.

Mission: To create awareness of the importance and benefits of physical activities in day-to-day life and encourage regular physical activities for a positive health life -style.

Step 2: Defining Program Outcomes (PO's) and Program Specific Outcomes (PSO's) of the program.

Programme Outcomes (Pos)

After completing B. A. degree programme, students will be able to:

PO 1:	Understand the disciplinary content knowledge, application of pedagogical content knowledge to teaching of physical education (Content Knowledge)
PO 2:	Use effective communication skills and strategies to enhance student engagement & learning.
PO 3:	Use appropriate technology to enhance teaching and learning and enhance personal and professional productivity (Proficiency in technology)
PO 4:	Identify diverse needs, plan inclusive classroom experiences and facilitate guidance and counselling programs for differently abled students (Inclusion)
PO5:	Foster relationships and collaboration with colleague's parent's community to support student's growth and wellbeing (Collaboration)

Programme Specific Outcomes (PSOs)

After Completion of B.A. in Physical Education students will be able to:

PSO 1:	Awareness – Create awareness about physical fitness and sports.
PSO 2:	Understand different training methods of Physical Education.
PSO 3:	Knowledge- Apply knowledge of physical education and sports for personality development.
PSO 4:	Ethics – Learn different values including hard work, respect, cooperation, teamwork etc.
PSO5:	Practical Knowledge – Apply the practical knowledge for different play grounds and rules of different games.

Course Outcomes (Cos)

B.A.I (Sem. I)

Course 1: Course 1: Introduction of Physical Education (I) DSE

CO 1.1	The meaning, definition, concepts of physical education.
CO 1.2	The changing concepts of physical education.
CO 1.3	Aim and Objectives of Physical Education
CO 1.4	Practical knowledge of Indian game and athletics

B.A.I (Sem. II)

Course 2: Foundation of Physical Education (II) DSE

CO 2.1	Understand the body posture and its characteristics.
CO 2.2	Learn physical fitness factors and theories of Play.
CO 2.3	Practical knowledge of Ball game and Yoga.

B.A.II (Sem. III)

Course 3: History of the Physical Education III) DSC

CO 3.1	Understand the physical education in ancient period of India.
CO 3.2	Knowledge of Olympic Games.
CO 3.3	Practical Knowledge of Indian game and athletics.

B.A.II (Sem. III)

Course 4: Organization and Administration in Physical Education(IV) DSC

CO 4.1	Understand organization and administration.
CO 4.2	Learn different tournaments of Shivaji University.
CO 4.2	Practical knowledge of Ball game and Yogasanas.

B.A.II (Sem. IV)

Course 5: History of the Physical Education (V) DSC

CO 5.1	Understand the development of physical education in India.
CO 5.2	Learn different institutions of sports and awards.
CO 5.3	Practical knowledge of Suryanamaskara.

B.A.II (Sem. IV)

Course 6: Organization and Administration in Physical Education (VI) DSC

CO 6.1	Understand methods of tournaments.
CO 6.2	Learn playground facilities and sports equipment.
CO 6.3	Practical knowledge of ground marking.

B.A.III (Sem. V)

Course 7: Health Education (VII) DSC

CO 7.1	The Meaning, definitions, Nature and scope of Health Education.
CO 7.2	Personal Health, and Factors influencing on Health.
CO 7.3	Social Health, Communicable diseases Causes & Prevention (HIV / AIDS, Malaria, Dengue, Chikungunya, Swine Flu, Corona etc.)
CO 7.4	Health of the Community, Health problems in family, Community, School and Colleges.

B.A.III (Sem. V)

Course 8: Recreation in Physical Education (VIII) DSE

CO 8.1	Concept, Definitions, Nature and function of Rhythm.
CO 8.2	Need & Importance of Rhythmic exercise.
CO 8.3	Meaning, Definitions, Concept of Recreation, Aim & Objectives of recreation
CO 8.4	Recent trends in recreation Hiking, Trekking, Sports camps and Competitions, Aerobics and Zumba

B.A.III (Sem. V)
Course 9: Yoga (IX) DSC

CO 9.1	Aim, Objectives and Scope of Yoga in Human Life
CO 9.2	Yoga and Physical Health: Promotive, Preventive and Curative aspects Of Physical Health
CO 9.3	Yoga and Mental Health: Nature of problems, Promotive, Preventive and Curative aspects of mental health through Yogic practices.

B.A.III (Sem. V)
Course 10: Anatomy And Physiology (X) DES-E-230

CO 10.1	Introduction OF Anatomy, Physiology and Physiology of exercises
CO 10.2	The cell and its parts
CO 10.3	Structure, classification and Functions OF Skeletal System, Muscular System, Respiratory System.

B.A.III (Sem. V)
Course 11: Dietetics And Nutrition (XI) DSE

CO 11.1	Need & importance Diet components Carbohydrates, Proteins, Fats, vitamins. Mineral Fibers and water.
CO 11.2	Meaning, Definition and sources Of Balance Diet.
CO 11.3	Malnutrition
CO 11.4	Causes, sign and symptoms OF Underweight and Obesity.

B.A.III (Sem.VI)
Course 12: Health Education Program (XII) DSC

CO 12.1	Health Program and Importance of exercises in health and fitness. Drugs, Alcohol and Tobacco-Adverse effect on performance.
CO 12.2	Need Importance and Scope of Population Education, Role of Health education in population education.
CO 12.3	Aims & Objectives program and projects World Health Organization, WHO in india and HIV / AIDS - causes, symptoms and prevention.

B.A.III (Sem.VI)
Course 13: Research In Physical Education (XIII) DSE

CO 13.1	Concept, Meaning and Definition of Research.
CO 13.2	Types of research
CO 13.3	Research Process, Stages in research process.

B.A.III (Sem.VI)
Course 14: Yoga And Health (XIV)

CO 14.1	Relationship of Yoga with Emotional Health and Structure of Human body and yogasanas.
CO 14.2	Effect of yogic exercises on respiratory and nervous system.
CO 14.3	Psychophysical basis of promoting sports career and Contribution of yogic practices for the development of Sports performances.

B.A.III (Sem.VI)
Course 15: Anatomy and Physiology of Exercise (XV) DSE

CO 15.1	Circulatory System: Blood, Heart structure and function, Blood pressure, Pulse, Blood groups, Oxygen debt.
CO 15.2	Organ of digestive system (Mouth, teeth, salivary glands, pharynx, oesphages, stomach, smalland large intestine, pancreas, liver, structure and function - in brief.
CO 15.3	Excretory System: Structure and function of Kidney and skin, Nervous System: Structure of brain and spinal cord, Reflex action.

B.A.III (Sem.VI)
Course 16: Dietetics and Hygiene (XVI) DSE

CO 16.1	Food sources and their effect (Natural food, Impure food, Processed food, Stimulants)
CO 16.2	Meaning, Need and importance Athlete Diet.
CO 16.3	Immunity (Personal hygiene - desirable hygiene habits) and School Health program.

Step 4: Defining relation between Course Outcomes (COs) and POs/PSOs for each course to obtain overall CO mapping with each POs/PSOs. (Course Articulation Matrix)

In this step, CO's of each course are mapped with PO's & PSO's. A correlation is established between CO's and PO's / PSO's in the scale of 0 to 3. 0 if there is no correlation between CO's and PO's / PSO's, 1 being low, 2 being median and 3 being high.

For example, suppose program XYZ (say) has 4 PO's & 4 PSO's. Then, course articulation matrixfor a course – 1 (say) with two CO's is as follows.

CO's – PO's & PSO's mapping matrix (1-low, 2-medium, 3-high, 0-No correlation)

CO's	PO's / PSO's							
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO 1.1	2	2	2	1	3	2	0	2
CO 1.2	2	1	3	0	2	1	0	3

In the same way we have course articulation matrices for all courses in that Program.

CO’s – PO’s & PSO’s mapping matrix (1-low, 2-medium, 3-high, 0-No correlation)

CO's	PO's / PSO’s							
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO 1.1	2	2	2	1	3	2	0	2
CO 1.2	2	1	3	0	2	1	0	3
CO 2.1	3	1	2	0	3	2	0	2
CO 2.2	2	1	3	1	2	3	1	3
CO 3.1	3	0	2	0	3	2	0	1
CO 3.2	3	0	3	2	3	3	1	1
CO 4.1	2	2	2	0	3	1	0	2
CO 4.2	3	2	3	2	3	2	1	2
CO 5.1	3	0	3	0	3	3	0	2
CO 5.2	2	0	2	2	3	3	1	2
CO 6.1	2	1	3	0	2	3	0	2
CO 6.2	2	1	3	0	3	3	1	3
CO 7.1	1	2	2	1	3	1	2	2
CO 7.2	1	0	2	2	3	1	2	3
CO 8.1	0	3	2	2	2	3	3	2
CO 8.2	0	3	2	2	2	2	3	2
CO 9.1	3	0	2	0	2	2	1	1
CO 9.2	2	0	2	0	3	3	1	2
CO 10.1	3	1	3	0	2	2	3	0
CO 10.2	3	0	2	0	2	2	1	1
CO 11.1	2	0	3	0	3	2	0	1
CO 11.2	3	1	3	0	2	2	1	1
CO 12.1	1	0	2	1	3	1	2	2
CO 12.2	1	0	2	2	3	1	2	3
CO 13.1	1	2	2	1	2	3	3	1
CO 13.2	1	2	2	1	2	3	3	2
CO 14.1	2	0	2	0	2	1	0	1
CO 14.2	2	1	3	0	2	1	0	1
CO 15.1	3	0	2	0	3	2	1	1
CO 15.2	2	1	2	0	2	2	1	1
CO 16.1	2	0	2	0	2	2	0	1
CO 16.2	3	1	2	0	3	2	1	1

Step 5: Development of overall CO's-PO's mapping matrix for all courses (Program Articulation Matrix).

The CO levels corresponding to each PO/PSO in course articulation matrix are averaged to obtain overall level of relation of course with each PO & PSO. For example, the overall relation of course – 1 (say) are reported the following matrix.

CO's	PO's / PSO's							
	PO1	PO2	PO3	PO4	PSO1	PSO2	PSO3	PSO4
CO 1.1	2	2	2	1	3	2	0	2
CO 1.2	2	1	3	0	2	1	0	3
Average ($X_{1,.,l}$)	2	1.5	2.5	0.5	2.5	1.5	0	2.5

Similarly, the overall level of relation of all the courses in the program is established. These levels are reported in the matrix form and this matrix is called as the program articulation matrix. For example, if the program XYZ has 16 courses then the program articulation matrix will be as follows.

Program Articulation Matrix

ID	Course name	$X_{i,.,1}$	$X_{i,.,2}$	$X_{i,.,3}$	$X_{i,.,4}$	$X_{i,.,5}$	$X_{i,.,6}$	$X_{i,.,7}$	$X_{i,.,8}$
C_1	Course_1	2	1.5	2.5	0.5	2.5	1.5	0	2.5
C_2	Course_2	2.5	1	2.5	0.5	2.5	2.5	0.5	2.5
C_3	Course_3	3	0	2.5	1	3	2.5	0.5	1
C_4	Course_4	2.5	2	2.5	1	3	1.5	0.5	2
C_5	Course_5	2.5	0	2.5	1	3	3	0.5	2
C_6	Course_6	2	1	3	0	2.5	3	0.5	2.5
C_7	Course_7	1	1	2	1.5	3	1	2	2.5
C_8	Course_8	0	3	2	2	2	2.5	3	2
C_9	Course_9	2.5	0	2	0	2.5	2.5	1	1.5
C_{10}	Course_10	3	0.5	2.5	0	2	2	2	0.5
C_{11}	Course_11	2.5	0.5	3	0	2.5	2	0.5	1
C_{12}	Course_12	1	0	2	1.5	3	1	2	2.5
C_{13}	Course_13	1	2	2	1	2	3	3	1.5
C_{14}	Course_14	2	0.5	2.5	0	2	1	0	1
C_{15}	Course_15	2.5	0.5	2	0	2.5	2	1	1
C_{16}	Course_16	2.5	0.5	2	0	2.5	2	0.5	1

Step 6: Methodology for measuring of Course Outcomes (CO's), Program Specific Outcomes (PSO's) and Program Outcomes (PO's) and setting up the target level.

In this step, methodology for measuring the attainment level of learning outcomes is defined and the target levels for the batch are defined.

- **Methodology for the attainment of learning outcomes for this year:**

  Details of a program:

  - Name of the Program: XYZ
  - Program has n_1 PO's, say, $PO_1, PO_2, \dots, PO_{n1}$
  - Program has n_2 PSO's, say, $PSO_1, PSO_2, \dots, PSO_{n2}$

    Let $n = n_1 + n_2$, total number of PO's and PSO's.
  - For convenience, let us denote the PO's & PSO's $PO_1, PO_2, \dots, PO_{n1}, PSO_1, PSO_2, \dots, PSO_{n2}$ by $P_1, P_2, \dots, P_n$
  - Program has m courses, say, $C_1, C_2, \dots, C_m$
  - Each course C_i has k course outcomes (CO's) denoted as $CO_{i,1}$, $CO_{i,2}, \dots, CO_{i,k}$, $i = 1,2, \dots, m$. and k represents the number of outcomes particularly that of course.

Course articulation matrices and program articulation matrix are obtained as discussed in previous steps. Let $X_{i,j,l}$ be the level of correlation of $CO_{i,j}$ with P_l where, $i = 1,2, \dots, m$, $j = 1,2, \dots, k$, $l = 1,2, \dots, n$. Then, the overall CO levels with PO's & PSO's of course C_i is computed as $X_{i.l} = \frac{1}{k}\sum_{j=1}^{k} X_{ijl}$ Here k be the number of outcomes in the average course taken.

- **Attainment of COs:**

The CO attainment levels are measured based on the results of the internal assessment and external examination conducted by the university. The CO attainment level based on internal assessment and external assessment are computed separately.

Attainment levels based on internal/external assessment method are defined as follows:

Level 1: Average of student marks belongs to the class 0% - 20% for that assessment method

Level 2: Average of student marks belongs to the class 20% - 40% for that assessment method

Level 3: Average of student marks belongs to the class 40% - 60% for that assessment method

Level 4: Average of student marks belongs to the class 60% - 80% for that assessment method

Level 5: Average of student marks belongs to the class 80%-100% for that assessment method

Let ALC_E and ALC_I be the CO attainment level of the course based on external assessment and internal assessment respectively. The overall CO attainment of the course is calculated by taking 100% weight age to external assessment.

$$ALC = ALC_E.$$

Let $ALC_1, ALC_2, \dots, ALC_m$ be the attainment levels of the courses $C_1, C_2, \dots, C_m$ respectively.

The overall course attainment levels are categorized as below,

Level 1: Poor – if $0 < ALC_i \leq 1$,

Level 2: Average – if $1 < ALC_i \leq 2$,

Level 3: Good – if $2 < ALC_i \leq 3$,

Level 4: Very Good – if $3 < ALC_i \leq 4$,

Level 5: Excellent – if $4 < ALC_i \leq 5$.

For every course, we have set Very Good – Attained as target level that is we are aiming minimum level 4 (very good) and how the course status is attained in the performance of abilities of students.

At the end we will have attainment levels of all the courses,

ID	Course name	ALC_i	Level	Status
C_1	Course_1	4	Very Good	Attained
C_2	Course_2	4	Very Good	Attained
C_3	Course_3	4	Very Good	Attained
C_4	Course_4	4	Very Good	Attained
C_5	Course_5	4	Very Good	Attained
C_6	Course_6	4	Very Good	Attained
C_7	Course_7	5	Excellent	Attained
C_8	Course_8	5	Excellent	Attained
C_9	Course_9	4	Very Good	Attained

C_{10}	Course_10	5	Excellent	Attained
C_{11}	Course_11	4	Very Good	Attained
C_{12}	Course_12	5	Excellent	Attained
C_{13}	Course_13	4	Very Good	Attained
C_{14}	Course_14	5	Excellent	Attained
C_{15}	Course_15	4	Very Good	Attained
C_{16}	Course_16	5	Excellent	Attained

Step 7: Calculation of attainment levels of PO's and PSO's.

- **Attainment of PO's & PSO's:**

The attainment of PO's & PSO's are calculated using direct method. In direct method the attainment of PO's & PSO's are calculated through the attainment levels of courses. The course attainment values (ALC_i , i = 1, 2, 3, ….., m.) and the overall level of relation of course with each PO and PSO ($X_{i,.,l}$, i = 1, 2, 3, ….., m, l = 1, 2, 3, ….., n.) are used to compute direct attainment level of each PO and PSO.

Direct Assessment: Direct attainment level of the l^{th}, PO's & PSO's is calculated as follows.

$$DALP_l = \frac{1}{\sum_{i=1}^{m} ALC_i} \sum_{i=1}^{m} x_{i,.l,} * ALC_i \text{ ,l=1,2,…….n.}$$

ID	Course name	ALCi	$X_{i,.,1}$	$ALC_i * X_{i,.,1}$
C_1	Course_1	4	2	8
C_2	Course_2	4	2.5	10
C_3	Course_3	4	3	12
C_4	Course_4	4	2.5	10
C_5	Course_5	4	2.5	10
C_6	Course_6	4	2	8
C_7	Course_7	5	1	5
C_8	Course_8	5	0	0
C_9	Course_9	4	2.5	10
C_{10}	Course_10	5	3	15
C_{11}	Course_11	4	2.5	10
C_{12}	Course_12	5	1	5
C_{13}	Course_13	4	1	4
C_{14}	Course_14	5	2	10
C_{15}	Course_15	4	2.5	10
C_{16}	Course_16	5	2.5	12.5
Sum		70		139.5
$DALP_1$=139.5/70			1.9929	

Similarly, we have to find attainment levels of all PO's and PSO's.

Sr. No.	ALC_i	$X_{i,.,1}$	$X_{i,.,2}$	$X_{i,.,3}$	$X_{i,.,4}$	$X_{i,.,5}$	$X_{i,.,6}$	$X_{i,.,7}$	$X_{i,.,8}$
1	4	2	1.5	2.5	0.5	2.5	1.5	0	2.5
2	4	2.5	1	2.5	0.5	2.5	2.5	0.5	2.5
3	4	3	0	2.5	1	3	2.5	0.5	1
4	4	2.5	2	2.5	1	3	1.5	0.5	2
5	4	2.5	0	2.5	1	3	3	0.5	2
6	4	2	1	3	0	2.5	3	0.5	2.5
7	5	1	1	2	1.5	3	1	2	2.5
8	5	0	3	2	2	2	2.5	3	2
9	4	2.5	0	2	0	2.5	2.5	1	1.5
10	5	3	0.5	2.5	0	2	2	2	0.5
11	4	2.5	0.5	3	0	2.5	2	0.5	1
12	5	1	0	2	1.5	3	1	2	2.5
13	4	1	2	2	1	2	3	3	1.5
14	5	2	0.5	2.5	0	2	1	0	1
15	4	2.5	0.5	2	0	2.5	2	1	1
16	5	2.5	0.5	2	0	2.5	2	0.5	1
Sum	70	32.5	14	37.5	10	40.5	33	17.5	27

Sr. No.	$ALC_i * X_{i,.,1}$	$ALCi * X_{i,.,2}$	$ALCi * X_{i,.,3}$	$ALCi * X_{i,.,4}$	$ALCi * X_{i,.,5}$	$ALCi * X_{i,.,6}$	$ALCi * X_{i,.,7}$	$ALCi * X_{i,.,8}$
1	8	6	10	2	10	6	0	10
2	10	4	10	2	10	10	2	10
3	12	0	10	4	12	10	2	4
4	10	8	10	4	12	6	2	8
5	10	0	10	4	12	12	2	8
6	8	4	12	0	10	12	2	10
7	5	5	10	7.5	15	5	10	12.5
8	0	15	10	10	10	12.5	15	10
9	10	0	8	0	10	10	4	6
10	15	2.5	12.5	0	10	10	10	2.5
11	10	2	12	0	10	8	2	4
12	5	0	10	7.5	15	5	10	12.5
13	4	8	8	4	8	12	12	6
14	10	2.5	12.5	0	10	5	0	5
15	10	2	8	0	10	8	4	4
16	12.5	2.5	10	0	12.5	10	2.5	5
Sum	139.5	61.5	163	45	176.5	141.5	79.5	117.5
DALP $_l$	1.9929	0.8786	2.3286	0.6429	2.5214	2.0214	1.1357	1.6786

Step 8: Comparison of target level with obtained PO attainment.

In this step the target level of PO's and PSO's attainment are compared with obtained *DALP* $_l$

Attainment levels are defined as stated below.

Level 1: Poor – if $0 < ALC_i \leq 1$,

Level 2: Average – if $1 < ALC_i \leq 1.5$,

Level 3: Good – if $1.5 < ALC_i \leq 2$,

Level 4: Very Good – if $2 < ALC_i \leq 2.5$,

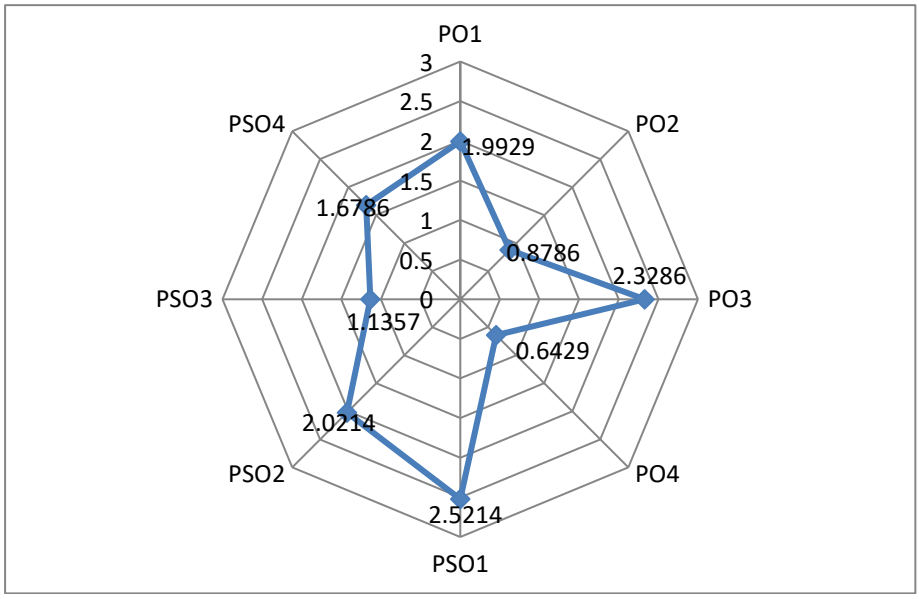
Level 5: Excellent – if $2.5 < ALC_i \leq 3$.

For every PO's and PSO's, we have set level 3 as target level that is we are aiming minimum level 3 (good) in the performance of abilities of students.

Attainment level of all the POs and PSOs

PO's	*DALP* $_l$	Level	Status
PO1	1.9929	Good	Attained
PO2	0.8786	Poor	Not Attained
PO3	2.3286	Very Good	Attained
PO4	0.6429	Poor	Not Attained
PSO5	2.5214	Excellent	Attained
PSO6	2.0214	Very Good	Attained
PSO7	1.1357	Average	Not Attained
PSO8	1.6786	Good	Attained

P_l attainment target level say, 3, indicates that, the department is aiming minimum level-3(good) in the performance of abilities of students.



Step 9: Planned actions:

Remedial Actions:

Planned actions for course attainment: Courses having course level less than level-4 are addressed bydesigning the different remedial measures like assignment/tutorials/remedial teaching.

Planned actions for program outcome attainment: PO's and PSO's with level attainment less than level-3 are addressed by planning remedial measures for the corresponding courses with respect tothan P_l.

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