BHARATHIDASAN UNIVERSITY,TIRUCHIRAPPALLI- 620 024
(ACCREDITED WITH A+ GRADE BY NAAC IN THE THIRD CYCLE)
DEPARTMENT OF PHYSICAL EDUCATION AND YOGA
BACHELOR OF PHYSICAL EDUCATION (B.P.ED)

CC-1 HISTORY PRINCIPLES AND FOUNDATION OF PHYSICAL EDUCATION
(21BPE11)

SEMESTER-I **CREDIT-4**

Unit-III

Biological Principles of Physical Education

Heredity and environment

Heredity

- Heredity is the transfer of characters from parent to off spring, either through their genes or through the social institution called inheritance. Heredity determines what an organism may become, not what it will become.
- Knowledge of the heredity or inheritance of plants and animals is important in many phases of our life.
- Heredity is very complex and a geneticist cannot possibly analyse all the traits of an organism at once. Instead, he studies only a few traits at a time.

Environment

- Environment means **anything that surrounds us**. It can be living (biotic) or non-living (abiotic) things. It includes physical, chemical and other natural forces. Living things live in their environment. ...

There are three types of Environment

- Natural environment
- Human environment
- Physical environment

Natural Environment:-

- These include the living and non-living things that were made by Nature.

E.g. Mountains, Lakes, Rivers, Vegetation, Soil, Natural disasters etc.

Human Environment:-

- As the name tells us it is made with the help and effort of human beings.

E.g. Buildings, Roads, Industries, Electronics, Vehicles etc.

Physical Environment:-

- The physical environment includes all of the natural resources that provide our basic needs for survival and development.

E.g. Land, Air, Water, Soil etc.

Gender characteristics

Anatomical and physiological difference between male and female

SI. NO	FEMALE	MALE
1.	Girls grow faster up to the age of early adolescence and slow down after the age of 14 years	Before adolescence slow and they grow faster after 14-16 years.
2.	Girls are smaller in size	Taller in size
3.	Female has broader and shallow pelvis which causes difficulty in running.	Narrow in pelvis
4.	Women have large body for swimming	Shorter trunk and long legs.
5.	Female should is weaker	Broader and strong shoulders
6.	Muscle strength is weaker	More muscle power
7.	Women have smaller heart and faster pulse rate	Large heart
8.	Female growth stops around 18-20 years	Boys grow till the age of 20-23 years
9.	Poor reaction time and movement time	Better reaction time
10.	Emotionally weak	Emotionally stronger
11.	Menstruation	Don't have
12.	Shallow breathe	Breathe deeper

Classification of body types (SHELDON'S Body Types)

Three Different The three different body types are:

- Ectomorph,
- Endomorph,
- Mesomorph.

1. Ectomorph Body **Typical Characteristics:**

- Long and lean, Delicate frame
- "Hard gainer" – Finds it difficult to build muscle and fat
- Body similar to a marathon runner, Fast metabolism

2. Endomorph Body Typical Characteristics:

- Stocky build, Wider body
- Stores fuel (both muscle and fat) in the lower half of their bodies
- Has more muscle as well but usually, this comes with more fat
- Has the best strength advantage out of the three different body types but may find it difficult to stay lean
- Slow metabolism

3. Mesomorph Body Typical Characteristics:

- Middle of the body types
- Can be lean and muscular simultaneously
- Natural athletics build with well-defined muscles

(Kretschmer) BODY TYPES

Asthenic type

- Which means ‘without strength’ it refers to person who is tall, slim, and lanky, with in legs, flat chest, slender neck and arms. They lack the strength and endurance required for vigorous sports. They have the advantage of speed and agility.

Athletic type

- Means “a contender for a prize”. Persons of this type are type is muscular, heavy built average height, with broad shoulders, strong and sturdy arms and legs and prominent chest.

Pyknic type

- Means thick, close - knit or dense. The person in this group is short, with broad rounded shoulders, short and heavy neck, barrel like chest, protruding abdomen and large head.

Growth and development

Growth

- The process through which body increases in size and shape is known as growth. Process of growth is biological in nature.
- When these organs changes in size and shape, it is known as physical growth.
- All the organs of body grow at different rate. For this reason growth is considered a tangible biological process.
- In this process various organs of the human body develop in respect of size, height and weight.
- There occurs an in the size of cells of body and muscles.

Development

- A process which brings human body towards the point of maturity is known development.
- The various kinds of qualitative changes that take places in human body are considered development in true sense.
- Process of development is more concerned with external factors.
- If all these external factors are not ensured properly, development will not take place properly.
- Although concepts of development and growth are different, but they are inter - related to each other.

TYPES OF AGES

Anatomical Age

- The process which brings a kind of development in the skeletal system of individual is known as anatomical age. In determining the anatomical age of a person, quality of bone structure plays an important role. To determine the extent or rate of development taking place in skeletal system, technique of X-ray is being used.

Chronological age

- Age of a person that is determined by the day on which he was born and the time of this occurrence. Thus that age of a person which can be recorded in terms of years, months and days is termed as chronological age. To calculate this kind of age, the day on which child takes birth and the day on which he dies are being taken into consideration. To decide whether a student should be included in the junior, sub-junior or senior teams, this kind of age is considered.

Mental Age

- To the mental development of a child, his mental age is concerned. Mental development can be considered a process of mental maturation taking place in an individual.
- One thing should be kept in mind there lies a lot of difference between physical and mental maturity.

Physiological Age

- Physiological capabilities of students affect their age to a lot of extent. Generally, it is concerned with puberty. While calculating the age of a child, secretion of hormones from various glands and functional conditions of the organs should be taken into account.

Anthropometric Parameters

Height/ Stadiometer Measurement Technique

- The subject places his/her heels . The subject must be barefoot, together, with both heels touching wearing as little clothing as possible the base of the vertical board
- The subject stands on a flat surface, The medial borders of the feet are at at a right angle to the vertical board an angle of about 60° of the stadiometer The scapulae and buttocks must also
- His/her weight is distributed evenly be in contact with the vertical board over both feet, with the head
- The subject must inhale deeply and positioned in the Frankfurt maintain a fully erect position Horizontal Plane (in this position, the without altering the load on the heels most inferior point on the left orbital
- The movable head board is brought margin is at the same horizontal level onto the most superior point on the as the left trigon – the line of vision head with sufficient pressure to is approximately horizontal) compress the hair . The arms hang freely by the sides of the measurement is taken to the trunk, with palms facing the nearest 1 mm thighs

Mass/Weight Measurement Technique

- Subject must be barefoot and wear as little clothing as possible. Subject stands on the platform of the scale with his/her weight distributed evenly over both feet. The arms hang by the sides of the trunk, with palms facing the thighs.
- The subject is instructed to maintain a stable position while the measurement is taken.
- The measurement is taken to the nearest 0.1 kg.

BMI- **Body Mass Index**

- This ratio is expressed in Kg/m2 and provides a rough estimation of the body mass status of the individual in relation to his/her height.

THANKING YOU