

THE COMPUTING PROFESSION

NUCES, ISLAMABAD CAMPUS

(LECTURE SLIDES WEEK # 1)



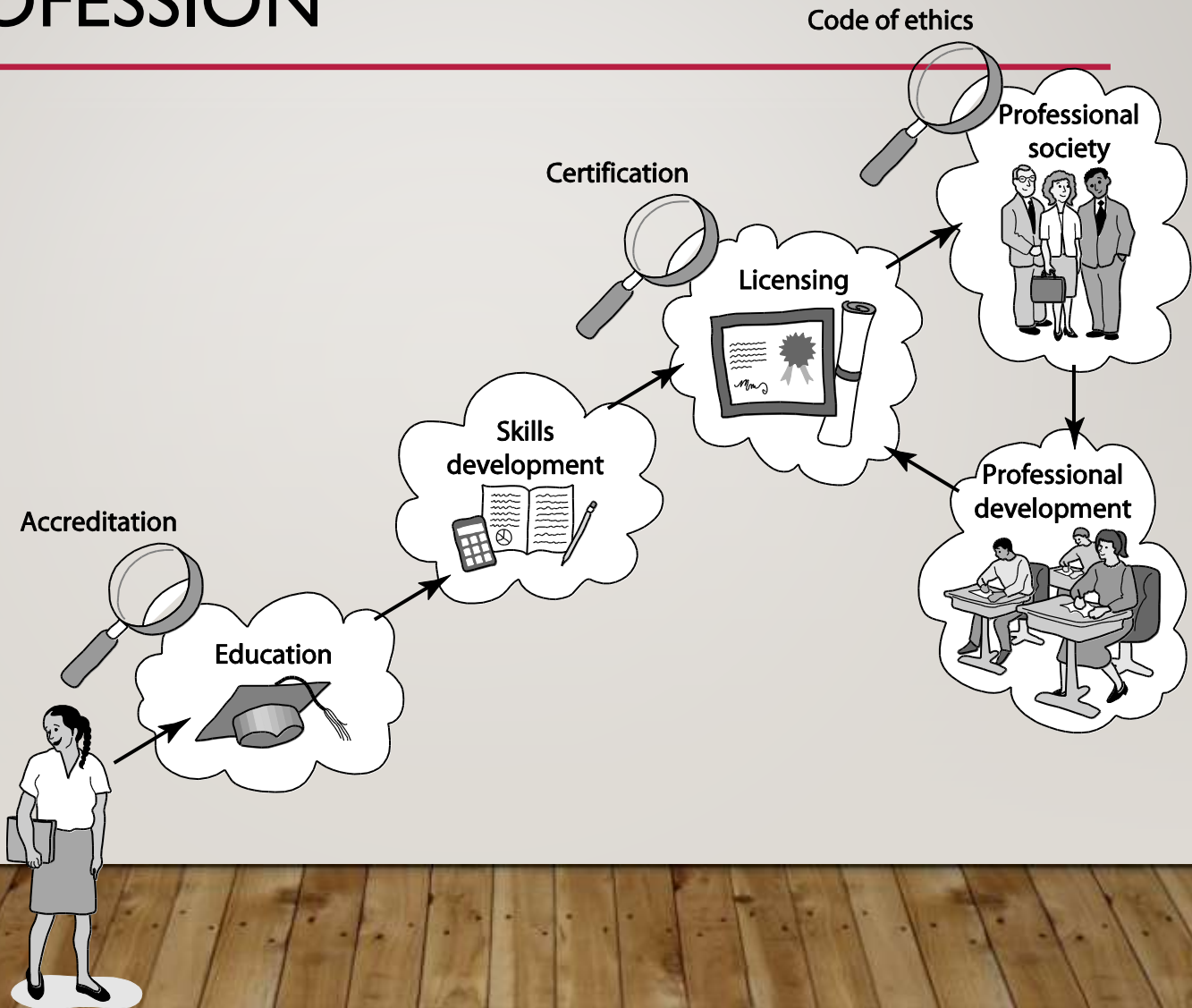
2 CHARACTERISTICS OF A PROFESSION

- No Single Definition
 - Who is using?
 - What is the Context?
- Characteristics:
 - Expert Knowledge
 - Special Technical Knowledge, Skills
 - Substantial Education and Training in order to Practice
 - Autonomy
 - Independence in conducting Professional Practice
 - Members themselves decide Training Nature and control Entry
 - One or more Professional Bodies
 - Codes of Conduct
 - Internal Governance
 - Controlled by its Practitioners
 - No External Authority
 - Service to Society

3 COMPUTING PROFESSION

- Is Computing a Profession?
 - Expert Knowledge
 - Autonomy
 - Internal Governance
 - Service to Society

4 ATTRIBUTES OF A MATURE PROFESSION



5 CHARACTERISTICS OF A FULLY DEVELOPED PROFESSION

- Initial professional education
- Accreditation
- Skills development
- Certification
- Licensing
- Professional development
- Code of ethics
- Professional society

6 PROFESSIONAL ORGANIZATIONS

- Networking with one's fellow scientists and engineers is extremely important for personal and professional development.
- Professional societies sponsor conferences, publish journals, and serve as reviewers or editors.
- They set professional and educational standards and provide job and career services for their members.

7 PROFESSIONAL BODIES

- **Professional Bodies:**

- **Overview:**

- A profession is typically organized into one or more professional bodies. Usually starts by a group of people coming together because of a shared interest in a particular type of activity
- A **professional** association/**body** is usually a nonprofit organization seeking to further a particular profession, the interests of individuals engaged in that profession and the public interest.
- A group of people in a learned occupation who are entrusted with maintaining control or oversight of the legitimate practice of the occupation;" also a body acting "to safeguard the public interest;" organizations which "represent the interest of the professional practitioners," and so "act to maintain their own privileged and powerful position as a controlling body.

- **Importance**



8 PROFESSIONAL BODIES

- **Professional Bodies:**

- **Major Functions:**
 - Establishing a code of conduct:
 - Regulate members professional behaviors and disciplinary procedures
 - Establishing mechanisms for disseminating knowledge:
 - Good practices and new developments
 - Publications, Conferences, WWW
 - Setting membership criteria
 - Advising Government and Regulatory Bodies
- **Moving Status (Country to Country)**
- **Reservation of Title and Functions by the Govt.**

9 PROFESSIONAL SOCIETIES

- ACM – 97,000 members
- IEEE-CS – 75,000 members

Both support members through

- Publications, conferences, local chapters, student chapters, technical committees and the development of standards
- Professional society

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- [ACM \(Association for Computing Machinery\)](#) “world’s largest educational and scientific computing society;” focused on advancing computing as a science and a profession.
- [Association for the Advancement of Artificial Intelligence \(AAAI\)](#) “nonprofit scientific society devoted to advancing the scientific understanding of the mechanisms underlying thought and intelligent behavior and their embodiment in machines.”
- [Association for Women in Computing \(AWC\)](#) “one of the first professional organizations for women in computing” focused on “promoting the advancement of women in the computing professions.” **(PWIC)**
- [Computing Research Association](#) focus is “to enhance innovation by joining with industry, government and academia to strengthen research and advanced education in computing”
- [IEEE Computer Society](#) “world's leading membership organization dedicated to computer science and technology”
- [IEEE \(Institution of Electrical and Electronics Engineers\)](#) “world’s largest professional association for the advancement of technology” **(WiE)**
- [IET \(Institution of Engineering and Technology\)](#) “To inspire, inform and influence the global engineering community, supporting technology innovation to meet the needs of society.”

II PROFESSIONAL REQUIREMENTS

- Origins of Professions

- Revolutions -> New Professions

- Hunters and Gatherers

- Agrarian Revolution -> Birth of Civilization

- Industrial Revolution -> Capitalism, Colonialism, Nation State

- ICT Revolution -> Knowledge Economy -> Information Age, Artificial Intelligence, Data is a wealth

12 JOB THAT DID NOT EXIST A FEW YEARS BACK

- App Developer
- Data Scientist
- Educational Consultant
- Millennial Generation Expert
- Social Media Architect
- Business Architect
- Cloud Architect
- App Developer. ...
- Telemedicine Physician. ...
- Virtual Assistant
- Social Media Manager.
- SEO Analyst. or search engine optimization specialist
- Uber Driver. ...
- Driverless Car Engineer. ...
- Podcast Producer. ...
- Zumba Instructor.
- Employment Brand Manager
- Content Moderators

I3 PROFESSIONAL REQUIREMENTS:

- Set of highly developed skills and Deep knowledge of the domain
 - Skills developed through experience
 - Skills must be backed-up by well-developed knowledge base
 - Shallow knowledge could be damaging
 - Decisions require understanding, analysis, and adoption of concepts to suit the environment
 - Technicians vs. Engineers / Scientists

Professional Requirements

- Professional Requirements:
 - Autonomy:
 - Professionals provide either products or services
 - Power Balance – Provider vs. Receiver
 - Professional:
 - The Power Play is in favor of the Professional
 - Lawyer and a Client
 - Physician and a Patient
 - Engineer and a Customer
 - Non-Professional:
 - The Power Play is in favor of the Customer
 - Auto-Mechanic and a Client
 - Varying the way – Professional vs. Non-Professional
 - Marked differences in the way the service is provided

15 PROFESSIONAL REQUIREMENTS

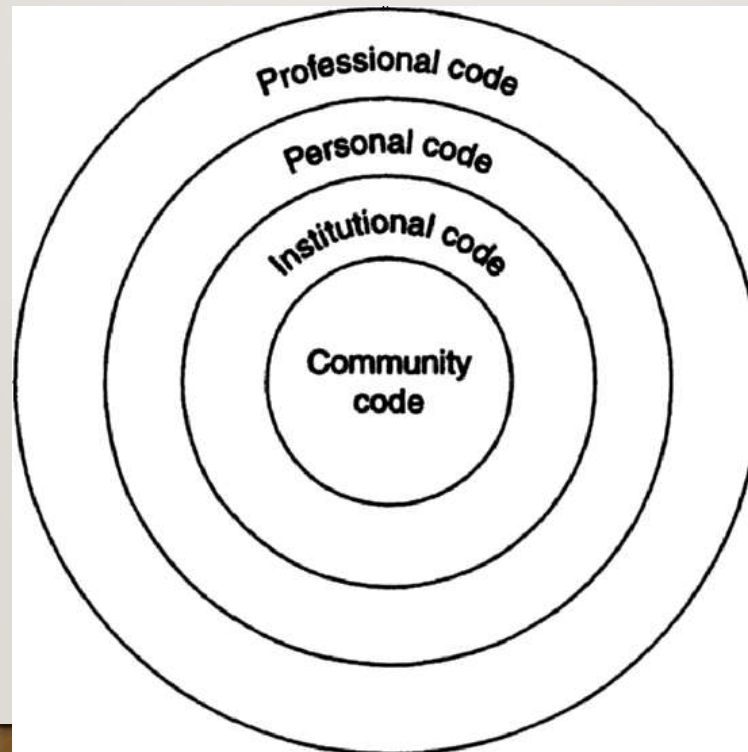
- Professional Requirements:
 - Observance of Code of Conduct:
 - The Professional Code
 - Set of Guidelines – What a Professional ought to do and not to do
 - Protects – Image of the Profession and that of Professional
 - Professionals are required to adhere the Code
 - The Personal Code
 - Individual Moral Guidelines
 - Mostly acquired from the Cultural Environment
 - Supplement the Professional Code Significantly

16 PROFESSIONAL REQUIREMENTS

- Professional Requirements:
 - Observance of Code of Conduct:
 - The Institutional Code
 - Imposed by the Institution / Organization
 - Meant to build and maintain the public's confidence in the Institution and its Employees
 - The Community Code
 - Developed over a period of time
 - Based on either the Religion or the Culture
 - May be imposed by the Civil Law

17 Professional Requirements

- Professional Requirements:
 - Observance of Code of Conduct



PILLARS OF PROFESSIONALISM

- Professionalism is Supported by Four (4) Pillars:
 - Commitment
 - Integrity
 - Responsibility
 - Accountability

19 PILLARS OF PROFESSIONALISM (CONTD.)

- **Commitment**

- The person making the commitment must do so willingly without duress
- The person responsible must try to meet the commitment, even if help is needed
- There must be agreement on what is to be done, by whom, and when
- The commitment must be openly and publicly stated
- The commitment must not be made easily
- Prior to the committed date, if it is clear it cannot be met, advance notice must be given and a new commitment negotiated

20 PILLARS OF PROFESSIONALISM (CONTD.)

- Integrity

- State of undivided loyalty to self-belief
 - Honesty, Un-compromising self-value, Incorruptibility
- Three Maxims of Integrity:
 - Vision
 - Capacity to anticipate and make a plan of action
 - Sign of Good Leadership
 - Initiative, Autonomy, Authority
 - Love of what is doing
 - People do better if they love what they do
 - Commitment
 - Bonds until it is done

21 PILLARS OF PROFESSIONALISM (CONTD.)

- Responsibility
 - Deals with Roles, Tasks, Actions, and Consequences
 - Various Types: Professional, Personal, Communal, Parental etc.
 - Responsibilities vary depending on age/role
 - Professional Responsibilities as a Provider:
 - Product Responsibilities
 - Service Responsibilities
 - Consequential Responsibilities

22 PILLARS OF PROFESSIONALISM (CONTD.)

- Accountability
 - Obligation to answer for the execution of one's assigned Responsibilities
 - Process:
 - **Setting** Measurable Goals, **Planning** what needs to be done to meet those Goals, **Reporting** Progress towards Goals, **Evaluating** the Reports, and **Using** that feedback to make Improvements
 - Three Key Elements:
 - A set of outcome measures that reliably and objectively evaluate performance
 - A set of performance standards defined in terms of these outcome measures
 - A set of incentives for meeting the standards and/or penalties for failing to meet them