PROFESSIONAL PRACTICES

MID - TERM FULL COURSE

WEEK # 1

2. Introduction to Information Technology (IT)

Definition of Technology

- **Technology** refers to tools, systems, or methods that **extend human capabilities** and modify social interactions.
- Example: Smartphones enhance communication but also change social behavior.

Definition of Information Technology (IT)

- IT encompasses:
  - **Computer systems** (hardware/software)
  - **Data processing & storage** (databases, cloud computing)
  - **Networking & cybersecurity**

Impact of IT on Society

Positive Effects	Negative Effects
Faster communication (email, messaging)	Social isolation (less face-to-face interaction)
Automation improves efficiency	Job displacement due to AI/robotics
Remote work flexibility	Health issues (screen fatigue, sedentary lifestyle)
Access to global information	Privacy concerns (data breaches, surveillance)

3. Scope of Technology in Modern Work

Key Areas Where IT Plays a Role

1. **Business Operations**
    a. **Automation** (e.g., AI chatbots, robotic process automation)
    b. **Data Analytics** (predictive modeling, big data)
2. **Project Management**
    a. Tools like **Trello, Asana, Jira** for task tracking.
    b. **Risk assessment** using AI algorithms.
3. **Communication & Collaboration**
    a. **Unified Communications (UC)** integrates emails, calls, and video conferencing.
    b. **Virtual teams** rely on Slack, Microsoft Teams, Zoom.

Challenges in IT Implementation

- **Costs:** Hardware, software licenses, training.
- **Security Risks:** Cyberattacks (ransomware, phishing).
- **Adaptation:** Employees resisting new technologies.

4. IT in Communication (Detailed Breakdown)

A. Email

- **Definition:** Electronic messages sent over networks.
- **Features:** Supports attachments (documents, videos).
- **Security Risks:** Spam, phishing attacks.

B. Intranet vs. Internet

Intranet	Internet
Private (company-only access)	Public (global access)
Used for internal docs, HR portals	Used for public websites, social media

C. VoIP (Voice over IP)

- **Examples:** Skype, WhatsApp calls.
- **Advantages:**
    - Cost-effective (free/low-cost calls).
    - Supports video calls and file sharing.

D. VPN (Virtual Private Network)

- **Purpose:** Secures remote connections by encrypting data.
- **Use Case:** Employees working from home accessing company files securely.

E. Social Networking in Business

- **Professional Use:** LinkedIn for hiring, Twitter for customer service.
- **Risks:** Misinformation, cyberbullying, data leaks.

F. File Transfer Protocols (FTP)

- **Usage:** Uploading website files to servers.
- **Secure Alternatives:** SFTP (SSH File Transfer Protocol).

5. How Information Technology is Transforming the Nature of Work

Information Technology (IT) has fundamentally reshaped how businesses operate and how employees perform their jobs. Below is a **detailed breakdown** of the key ways IT is changing work across industries.

1. Automation: Reducing Human Intervention

What is Automation?

The use of **software, robotics, and AI** to perform tasks that were traditionally done by humans.

Impact of Automation

✅ **Pros:**

- Increases efficiency & reduces errors.
- Lowers operational costs.
- Frees employees for creative tasks.

❌ **Cons:**

- Job displacement (e.g., clerical roles).
- High initial setup costs.
- Requires retraining workers.

2. Remote Work & Digital Nomadism

How IT Enables Remote Work

- **Cloud Computing** (Google Drive, Dropbox) → Access files anywhere.
- **Collaboration Tools** (Slack, Zoom, Teams) → Virtual meetings & chats.
- **VPNs & Cybersecurity** → Secure remote access to company networks.

Trends in Remote Work

- **Hybrid Work Model** (Office + Home).
- **Digital Nomads** (Work from anywhere globally).
- **Virtual Offices** (No physical HQ, fully remote teams).

Challenges

🌍 **Time Zone Differences** → Scheduling meetings.

🔒 **Security Risks** → Data breaches via unsecured networks.

🤝 **Team Bonding** → Lack of face-to-face interaction.

3. Big Data & Predictive Analytics

How Businesses Use Data

- **Customer Insights** → Personalized marketing (Amazon recommendations).
- **Operational Efficiency** → Predictive maintenance in manufacturing.
- **Risk Management** → Fraud detection in banking.

The "8 V's of Big Data"

1. **Volume** → Massive datasets (terabytes/petabytes).
2. **Velocity** → Real-time data processing (stock trading algorithms).
3. **Variety** → Structured (databases) & unstructured (social media posts).
4. **Veracity** → Data accuracy & reliability.
5. **Validity** → Relevance to business goals.
6. **Vulnerability** → Cybersecurity threats (hacking, leaks).
7. **Visualization** → Dashboards & graphs for decision-making.
8. **Value** → Turning data into actionable insights.

Impact on Jobs

- **New Roles:** Data scientists, AI trainers.
- **Declining Roles:** Manual data entry clerks.

4. The Gig Economy & Freelancing Platforms

How IT Supports Freelancing

- **Platforms:** Upwork, Fiverr, Freelancer.
- **Payment Systems:** PayPal, Stripe, cryptocurrency.

Pros & Cons of Gig Work

Advantages	Disadvantages
Flexibility (choose projects)	No job security
Global opportunities	No employee benefits (healthcare)
Side income potential	High competition

5. Cybersecurity & New Work Challenges

Risks Introduced by IT

- **Phishing Attacks** → Fake emails stealing login details.
- **Ransomware** → Hackers encrypt company data for ransom.
- **Insider Threats** → Employees leaking sensitive data.

Solutions

- **Zero Trust Security** → Verify every access request.
- **Employee Training** → Spotting phishing scams.

Professional Practices - Week 2 Notes

1. Key Definitions

Profession

- A **paid occupation** requiring **advanced education, training, and skills**.
- Examples: Doctor, Engineer, Software Developer.

Professional

- A **qualified person** in a specific field.
- Example: *"She handled the situation professionally."*

Professionalism

- **Attitude and behavior** in the workplace.
    - How you speak, dress, and organize work.
    - Following **ethical standards**.

Professional Practices

- Applying knowledge **effectively** in a job/industry.
- Includes **ethics, career planning, and communication**.

2. Traits of a Profession

Four key characteristics:

1. **Specialized Skills** (e.g., surgery for doctors, coding for programmers).
2. **Society-Centric Motivation** (serving public needs).
3. **Standards of Excellence** (e.g., medical ethics, coding standards).
4. **Contributing Back to Society** (e.g., open-source software, pro bono work).

3. Examples of Professions

High-Skill Professions	General Occupations
Doctor	Shopkeeper
Software Engineer	Driver
Pilot	Clerk
Teacher	Fisherman

4. Characteristics of a Profession

1. **Initial Professional Education**
    a. Degrees, diplomas, or certifications (e.g., CS degree for IT).
2. **Accreditation**
    a. Formal approval from recognized bodies (e.g., ABET for engineering).
3. **Skills Development**
    a. Continuous learning (courses, workshops).
4. **Certification & Licensing**
    a. Proof of expertise (e.g., AWS Certified, PMP).
5. **Professional Development**
    a. Mentoring, coaching, and training.
6. **Code of Ethics**
    a. Rules guiding conduct (e.g., ACM/IEEE Ethics Code).
7. **Professional Societies**
    a. Organizations like **ACM, IEEE** for networking and growth.

5. Professional Responsibilities (IT Field)

- Software development & maintenance.
- Network administration.
- Managing an organization's tech lifecycle.
- Following **engineering council regulations**.

6. Professionalism in the Workplace

7 Key Traits

1. **Confidence** – Believe in your abilities.
2. **Ethical Behavior** – Follow moral principles.
    a. *Ethics* = "What **should be** done."
    b. *Morality* = "What **is** commonly accepted."
3. **Expertise** – Continuously improve skills.
4. **Dress Appropriately** – Formal for interviews, neat for work.
5. **Maintain Poise** – Stay calm under pressure.
6. **Own Mistakes** – Admit errors and learn.
7. **Keep Promises** – Deliver on commitments.

7. Professional Practices

- Applying knowledge **practically** in jobs.
- Includes:
    - **Ethics** (honesty, integrity).
    - **Respect** (for colleagues, clients).
    - **Continuous Growth** (learning new tech).

WEEK # 3 to 8

1. **Moral Laws & Ethics** Ethics are moral rules that guide how professionals behave at work. In any job, professionals should act responsibly and follow rules that help the company and society.

🔹 **2. Ethics in Information Technology** These are issues people face when using technology in a fair and legal way:

- Tracking internet use and email at work.
- Downloading things illegally (piracy).
- Sending spam (unwanted emails).

- Hacking and identity theft.
- Students copying work (plagiarism).
- Cookies and spyware invading privacy.

1. **Tracking Internet Use and Email at Work**
   What it means: Employers often monitor what websites employees visit and what emails they send.
   Why it's a concern: It can feel like an invasion of privacy if workers aren't told they are being watched.
   Ethical issue: Should companies be allowed to monitor everything? Or should employees have some personal privacy at work?

🔹 **2. Downloading Things Illegally (Piracy)**

What it means: This refers to downloading software, movies, music, or games without paying or without the owner's permission.

Why it's a concern: It violates copyright laws and is unfair to the people who created the content.

Ethical issue: Even if it's easy to do, it's still stealing someone's work and harms the industry.

🔹 **3. Sending Spam (Unwanted Emails)**

What it means: Spam is junk email sent to many people who didn't ask for it.

Why it's a concern: It wastes time, clutters inboxes, and can contain dangerous links or scams.

Ethical issue: Sending spam is disrespectful and often done for selfish or illegal reasons, like advertising fake products.

🔹 **4. Hacking and Identity Theft**

What it means: Hacking means breaking into computers or networks. Identity theft is stealing someone's personal data (like credit card numbers or passwords) and using it as if you were them.

Why it's a concern: It causes serious damage—money loss, ruined credit, or personal harm.

Ethical issue: It's a direct attack on someone's privacy and security and is both unethical and illegal.

🔹 **5. Students Copying Work (Plagiarism)**

What it means: Plagiarism is when a student copies someone else's work and claims it as their own (e.g., from the internet or another student).

Why it's a concern: It's dishonest and unfair to students who do their own work.

Ethical issue: It violates academic integrity, and students don't truly learn if they cheat.

🔹 **6. Cookies and Spyware Invading Privacy**

Cookies: Small files that websites save on your computer to track your activity (like which pages you visit).

Spyware: Malicious software that secretly monitors your actions, collects your data, or even steals passwords.

Why it's a concern: Many users don't even know this is happening, and their private information is being collected without consent.

Ethical issue: It's unethical to track or use someone's personal data without telling them or getting permission.

Software Engineering Code of Ethics (8 Principles)

1. **Public** This principle focuses on protecting the public's safety and well-being.
   Key points:
   - Inform the public about any software-related dangers.
   - Approve and support only software that is safe and well-tested.
   - Only sign documents related to things you understand or are qualified in.
   - Be fair, truthful, and respect diversity.
   - Put the public interest above personal or company gain.
   - Use your skills for good causes and take full responsibility for your work.

   📌 Goal: Always act in a way that benefits and protects the general public.

🔹 **2. Client and Employer** This principle ensures loyalty and honesty towards the people you work for.

Key points:

- Work only in areas where you're competent.
- Use only approved resources and property.
- Don’t use illegal software or steal data.
- Keep client information confidential.
- Raise concerns if a project becomes risky or unethical.
- Avoid outside work that may harm your employer or create a conflict of interest.

📌 Goal: Be honest, loyal, and act in the best interests of your clients and employers.

🔹 **3. Product** This principle is about creating high-quality and reliable software products.
Key points:

- Fully understand what the software is supposed to do (specifications).
- Make sure the goals are realistic and the software is well-managed.
- Follow proper development methods and maintain clear documentation.
- Test software properly and respect user privacy.
- Use data legally, remove outdated data, and follow industry standards.
- Ensure quality with reasonable cost.

📌 Goal: Develop software that is effective, ethical, and safe for users.

🔹 **4. Judgment** This principle deals with using honest and objective professional judgment.

Key points:

- Stay unbiased and professional in decision-making.
- Never accept bribes or secret payments.
- Only get paid from one source for each job.
- Avoid financial or personal conflicts of interest.
- Consider the ethical impact of your technical decisions.

📌 Goal: Make decisions based on fairness and facts, not personal gain.

🔹 **5. Management** This principle is for those in leadership or managerial roles.

Key points:

- Make sure employees understand ethical standards and confidentiality.
- Assign work based on people's skills and abilities.
- Handle code violations fairly and legally.
- Be clear about job expectations and rewards.
- Do not block someone's growth or ask them to act unethically.

📌 Goal: Lead fairly, ethically, and with respect for your team.

🔹 **6. Profession** This principle is about upholding the values of the software engineering profession.

Key points:

- Work with reputable and ethical professionals.
- Encourage others to follow the code.
- Admit and fix mistakes.
- Share your knowledge and stay up-to-date in your field.
- Follow laws, and don't let personal interests harm the profession.

📌 Goal: Support and grow the software engineering profession with integrity.

🔹 **7. Colleagues** This principle promotes good relationships with coworkers.

Key points:

- Help colleagues improve professionally.
- Don't judge others' work without their permission.
- Give credit where it's due.
- Respect and support coworkers' careers.
- Ask for help if you're not qualified to do something.

📌 Goal: Treat coworkers with fairness, respect, and professionalism.

🔹 **8. Self** This principle is about your personal responsibility and self-improvement.

Key points:

- Keep learning to improve your skills and knowledge.
- Understand the laws and this code of ethics.
- Don’t force others to break the rules.
- Understand that breaking the code is a serious matter.

📌 Goal: Be responsible for your actions and always aim to grow and improve.