

BITS & BYTES

Department of Computer Science
Parvatibai Chowgule College of Arts & Science (Autonomous)

About Bits & Bytes...

Hello Everyone,

In this edition of our newsletter, we dive into the latest innovations and trends shaping the world of technology and computer science. From various activities organized by the students to the faculty participation, it's all covered.

Stay ahead of the curve with student insights, in-depth articles on ethical hacking and so on. Explore the future of tech together!

Happy Reading!



In this newsletter you can expect:

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- Installation of the Firebits council

Article's:

- Ethical Hacking- (Serena Serrao SyBsc)
- Empowering Women in India: A Path to Progress (Tanvi Verlecar SyBsc)

Faculty Corner:

- Faculty Participation



Editor:
Velika Gomes
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DEPARTMENTAL ACTIVITIES

Inaugural of the Firbits Club 2024

The installation ceremony for the newly elected council members of the Firebits Club in the Department of Computer Science for the academic year 2024-25 was organized on 29/07/2024. The chief guest of the event was Mr. Anant Patil, an alumni from the first batch of PGDCA (1986). The Head of the Department delivered the opening speech at the inauguration, followed by insights about the club from the outgoing Firebits members. This was followed by the badging of the newly elected members, the taking of the oath, and the president's speech. The chief guest shared his experiences over the years, and finally, a vote of thanks concluded the ceremony.



ARTICLE'S

Ethical Hacking

In an increasingly interconnected world, cyber threats are a major concern for businesses, governments, and individuals alike. We all have sensitive data that is at risk, therefore there is a need for greater cybersecurity measures. Ethical hacking, also known as penetration testing, has emerged as a crucial practice to safeguard systems and networks by identifying vulnerabilities before anyone can try to hack it.



Ethical Hacking-Definition:

Ethical hacking involves legally testing the security of a system, network, or application to identify weaknesses that could be exploited by malicious hackers. Unlike cybercriminals, ethical hackers operate with permission from the system's owner. Their goal is not to cause harm, but to improve the security of the system by finding and fixing vulnerabilities.

Ethical hackers, often referred to as "white hat" hackers, employ the same tools and techniques as malicious hackers ("black hat" hackers), but their intent and outcome differ. They mimic real-world cyberattacks to identify security gaps, offering organizations a proactive approach to cybersecurity.

Key Roles of Ethical Hackers:

Penetration Testing: One of the primary tasks of an ethical hacker is to conduct penetration testing (or "pen testing"), where they simulate cyberattacks on networks, systems, or applications. The objective is to identify weaknesses that could be exploited by malicious actors.

Vulnerability Assessment: Ethical hackers analyze systems for vulnerabilities, cataloging potential flaws and their severity. This allows organizations to prioritize which vulnerabilities need to be addressed most urgently.

Reporting and Recommendations: After assessing security risks, ethical hackers provide detailed reports on their findings, including steps to mitigate the vulnerabilities and improve overall security posture.

Security Audits: In addition to pen testing, ethical hackers often perform security audits, reviewing an organization's security policies, procedures, and practices to ensure compliance with industry standards and regulations.

The Ethical Hacking Process

The ethical hacking process is methodical and follows a structured approach. Here's a breakdown of the key stages:

Reconnaissance: Also known as the information-gathering phase, this is where ethical hackers collect as much data as possible about the target system. This may include network architecture, IP addresses, employee information, or software versions used.

Scanning and Enumeration: During this stage, ethical hackers use tools to scan the target for vulnerabilities. They map out the system, identifying any open ports, running services, or insecure software configurations that could be exploited.



Gaining Access: Ethical hackers simulate an attack by attempting to exploit the identified vulnerabilities. The goal is to gain unauthorized access to the system. Techniques such as SQL injection, cross-site scripting (XSS), or password cracking may be used at this stage.

Maintaining Access: Once access is gained, the hacker will assess how long they can maintain it without being detected. This is important for understanding the extent of a potential breach in a real-world attack scenario.

Covering Tracks and Reporting: In this final stage, ethical hackers simulate removing traces of their activity to evaluate how easily an attacker could cover their tracks. However, the key objective here is to report all findings to the organization, highlighting vulnerabilities and providing detailed remediation steps.

Conclusion:

Ethical hacking serves as a vital line of defense in the battle against cybercrime. By identifying vulnerabilities before they can be exploited, ethical hackers help organizations safeguard their data, systems, and reputation. As cybersecurity becomes more complex and the stakes rise, the role of ethical hackers will only grow in importance. In a digital age where cyberattacks are inevitable, ethical hackers provide a crucial service—strengthening the barriers that protect our interconnected world.



~Serena Serrao
Computer Science
SyBsc

Empowering Women in India: A Path to Progress

The empowerment of women in India has seen significant changes in recent decades. It is deeply rooted in a rich cultural heritage but faces complex socio-economic challenges. The pursuit of gender equality in India reflects historical struggles and modern advancements. This article explores the multifaceted nature of women's empowerment in India, focusing on education, economic participation, political representation, cultural shifts, and technological advancements. Education plays a crucial role in women's empowerment in India. Traditionally, women had limited educational opportunities, especially in rural areas.



However, the Indian government has implemented initiatives to address this disparity. The "Beti Bachao, Beti Padhao" (Save the Girl Child, Educate the Girl Child) scheme has significantly increased female literacy rates by promoting girls' education and addressing barriers such as child marriage.

Economic empowerment is also vital, and the government has launched programs to boost female entrepreneurship and financial independence, such as the "Pradhan Mantri Mudra Yojana" (PMMY), providing microloans to women entrepreneurs. These efforts have helped women make significant contributions to economic growth and innovation. However, women still face limited participation in the labor market, gender-based discrimination, and obstacles to equal pay and leadership roles. Addressing these challenges



requires systemic changes, including gender-neutral policies and promoting women's participation in high-growth sectors like technology and engineering. Progress has been made in women's political representation in India, particularly at the local level following the 73rd and 74th Constitutional Amendments. However, women's presence in national politics remains low. The Women's Reservation Bill, proposing to reserve 33% of seats in the Lok Sabha and state legislative assemblies for women, is pending enactment into law. Increasing women's representation is crucial to ensure that policies address the needs of all citizens and that gender equality remains a legislative priority.

Cultural and social barriers present significant challenges to women's empowerment in India. Deep-seated patriarchal norms often dictate gender roles and limit women's opportunities. Issues such as gender-based violence, including domestic abuse, sexual harassment, and dowry-related violence, continue to undermine women's safety and independence. Legal reforms like the Protection of Women from Domestic Violence Act (2005) and the Criminal Law (Amendment) Act (2013) have improved protections against violence, but enforcement remains inconsistent. Tackling these issues requires not only legal measures but also societal change.

Educational and awareness campaigns that challenge gender stereotypes and promote respect for women's rights are essential for reshaping cultural attitudes and creating safer environments for women. The impact of technology on women's empowerment is significant. The digital revolution has opened up new opportunities for women to access information, education, and economic empowerment. However, the digital divide continues to be a challenge in many rural and underserved areas.

Women's empowerment in India is a complex journey with achievements and challenges. Efforts to improve education, economic participation, political representation, technology access, and healthcare have made progress, but barriers remain. Continued advocacy and systemic change are needed for true gender equality, leading to a more inclusive and equitable society. This empowerment is essential for sustainable growth and societal advancement in India.



~Tanvi Verlecar
Computer Science
SyBsc

Faculty Participation:

1.]Ms. Suchitra Bhat, Associate Professor, participated in the 3 days online workshop on Statistical Data Analysis and Interpretation using MS-Excel organized by Department of Research and publications A2Z Edulearning Hub LLP on 15th, 16th and 17th July 2024 .



2.]Dr Shaila Ghanti , HoD and Ms. Dikshita Vishram Aroskar, Assistant Professor from Department of Computer Science attended Faculty Development Programme on High Performance Computing at Centre for Development of Advanced Computing (C-DAC), Bengaluru from 22nd July 2024 to 26th July 2024. The FDP was designed to provide advanced knowledge and practical skills in the field of High Performance Computing (HPC), with a strong focus on its applications in Artificial Intelligence (AI), Embedded Systems, and Cyber Security.

Faculty Participation:

The programme aimed to enhance the professional capabilities of faculty members from Higher Education Institutions (HEIs) particularly those with qualifications in IT, Computer Science, Electronics, Telecommunications, Electrical.



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Thank you for reading!

DEPARTMENT OF COMPUTER SCIENCE
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