

Indian Computer Science Curriculum: An Ethical Concern

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Abstract: *Human collaboration and compoment are at the core of computer scienceengineeringaccomplishments. Furthermore, computer artefacts areproduced to realisehuman requirements.As a didactic discipline Computer science endures to progress swiftly, and this development obliges recurrent updating of the curriculum. From last 50 years computer science has witnessed essentialamendmentsfor theacknowledgment that the framework and impact of this ever-evolvingtechnologies need to be taken into cognizance in its design phase, as our lives are highlyentangledin it. At global level innovative ways to integrate computer ethics into the computer science curriculum is experimented as per the recommendations of ABET, IEEE/ACM computer Science Curriculum 1991 and ImpactCS 1994. In India computer ethics is an unknown territory; this paperstudies the compulsion of integratingComputer Ethicsin the curriculum of CSE in the universities of India and suggests a framework for implementation.*

Keywords:*Computer Ethics; Computer science Curriculum; India;Ethics Integration.*

I. INTRODUCTION

The significance of teaching computer ethics in undergraduate computer science engineering curricula is shown by ACM/IEEE Computer Society Computing Curriculum 1991, by including various knowledge apparatuses of computing concerning social and ethical issue and thus creating a framework[1]; The ImpactCS project by National Science Foundation (NSF)in 1994[2] definedfundamental content and tools for incorporating social and ethical stuffthroughoutthe computer science curriculum.Globally in many countries like Australia computer ethics is a compulsory requirement to teach for accreditation of aprofessional computer science degree.

The goal of this paper is multifold; to help integrate computer ethics in the department of computer science in all universities ofIndia;to effectivelydevelop strategies for computer ethics teaching.

II. THE CONCEPTUAL BACKGROUND

Computer ethics got its inception in 1940 during World War II by Norbert Weiner. He wrote two books and accentuated that “Long beforeNagasaki and the public awareness of the atomic bomb, ithad occurred to me that we were here in the presence ofanother social potentiality of unheard-of-importance forgood and for evil”[3][4][5]. For detailed history of computer ethics see Juneed, et.al. 2017,“ComputerEthics from Obscure to Ubiquitous”. Integration of computer ethics in computer science curriculum got its practical form in 1991 when joint task force of the Association for Computing (ACM) and the Institute of Electrical and Electronics Engineers (IEEE) created a framework for computer ethics in the form of “Computing Curriculum 1991(CC91)”.This endorsed program delimited numerous knowledge components for computer ethics[1]. National Science Foundation (NSF) in 1994

further worked on these knowledge components by a project Impact Computer Science (ImpactCS). This project defined the fundamentals and strategies to integrate computer ethics across the computer science curriculum[6]. Computing Curricula 2001 (CC2001) came into vogue after a major evaluation in 1998. Among the fourteen-knowledge block, one pertaining to computer ethics viz. “Social and Professional Issues” was included. The revised curriculum CC2005

The accreditation policy by Computing Accreditation Commission of Accreditation Board for Engineering and Technology (ABET) specifies for a program to “enable students to attain, by the time of graduation: An understanding of professional, ethical, legal, security and social issues and responsibilities”: “An ability to make informed judgments in computing practice based on legal and ethical principles”. ABET recommends abundant exposure of social and ethical repercussions of computing such that a student gets a thorough understanding of computer ethics and its consequences[7].

Besides curriculum guidelines ACM and IEEE have established codes of ethics to help computer professionals understand and manage ethical responsibilities. In 1966, “Guidelines for Professional Conduct.” Was the first ACM code of ethics to “evolve into an effective means of preserving a high level of ethical conduct” In 1972, code was revised and eighteen “ethical considerations.” Were added to get more focus on professional conduct. In 1992, the code was again revised the “ACM Code of Ethics and Professional Conduct” containing “24 imperatives formulated as statements of personal responsibility.” In 1999, ACM and the IEEE-CS jointly fashioned the “Software Engineering Code of Ethics and Professional Practice”[8] that has been accepted worldwide by many organisations like :

- The Chinese Computer Federation and
- Spanish Software Engineering and Technology Society [9].

The ACM created the ACM Committee on Professional Ethics (COPE) to further strengthen and update the Code implemented in 1992[10]. COPE rigorously works for computer ethics to achieve following:

- Organises ethics-training workshops;
- rigorous computing ethics training;
- helps in ethical decision making; and
- Revision and updating of code of ethics.

“In recognition of changes in technology, the evolving literature on computing ethics, and advances in delivering computing ethics to undergraduates, COPE, on behalf of the ACM, is completing a three-year international project to update its Code of Ethics and Professional Conduct to address a broad range of issues including working in the defence industry, producing self-modifying software, maintaining privacy and security, and ethical approaches to issues in data science”[9]. The updated Code of ethics will have a broader ambit to espouse numerous “new Principles that address issues in specific computing technologies such as AI, machine learning, and autonomous machines making ethically significant decisions. The Principles of the Code remain general but will be presented with explanations and examples that draw on specific computing technologies, showing how they relate to concrete decisions of computing practitioners. The ACM Code of Ethics and Professional Conduct is a guide to proactive action that helps us, as a profession, to promote good and reduce unanticipated negative impacts”[9].

Globally computer ethics over the years has paved its way into the curricula of computer science institutions e.g. Singer designed a course at Stanford after 20 years’ experience of teaching different courses at the institution “Eric Roberts, who taught that course with Terry Winograd and Helen Nissenbaum, reported that [s]ince 1988-89, the Department

of Computer Science at Stanford University has offered CS201 (Computers, Ethics, and Social Responsibility) as part of its undergraduate curriculum” [11][12].

III. THE PEDAGOGICAL BACKGROUND

Computing Curricula 2001 specified ten knowledge entities under the domain of “social, ethical, and professional issues:

- SP1. History of computing [core]
- SP2. Social context of computing [core]
- SP3. Methods and tools of analysis [core]
- SP4. Professional and ethical responsibilities [core]
- SP5. Risks and liabilities of computer-based systems [core]
- SP6. Intellectual property [core]
- SP7. Privacy and civil liberties [core]
- SP8. Computer crime [elective]
- SP9. Economic issues in computing [elective]
- SP10. Philosophical frameworks [elective][13]”.

In countries like United States, Australia, UK etc. for receiving accreditation of their Computer Science programs, besides various prerequisite must have ample coverage of social and professional practises in their curriculum. In USA around all universities and colleges accredited by ABET’s

Computing Accreditation Commission having baccalaureate CS programs have included computer ethics in their curriculum, as shown below:

Name of College/University	Level of Teaching Ethics
Arizona SU.	JL
Boise State U.	SL
Bucknell U.	SL
Cal. State – Dominguez Hills	
Cal. State – San Bernardino	SL
Calvin College	SL
College of Charleston	Integrated
East Tennessee State U.	JL/SL+ Integrated
Eastern Washington State U.	SL
Florida Atlantic U.	SL
George Mason U.	FL + JL
Georgia Tech	SL
Grambling State U.	SOL
Indiana U. – Purdue U. Fort Wayne	Woven into senior capstone design
Kennesaw State U.	Woven into every course
Loyola College in Maryland	Senior level

Metropolitan State College of Denver	Junior level
Millersville U. of Pennsylvania	JL
Montana State U.	SOL
New Jersey Inst. of Technology	JL
Nicholls State U.	Integrated
Northeastern U.	JL +SL
Radford U.	Integrated
North Dakota State U.	SL
Oregon State U.	JL
Salem State College	Integrated
Southern Illinois U., Edwardsville	Integrated
Southwest Missouri State U.	Integrated
Texas Christian U.	Few Courses
U. Alabama, Huntsville	Integrated
U. California, Santa Barbara	FL
U. Central Florida	JL
U. Colorado, Denver	SL
U. Idaho	SL
U. Louisiana, Lafayette	JL
U. Mississippi	JL
U. Nebraska, Omaha	JL
U. Nevada, Reno	JL
U. New Hampshire	JL
U. New Orleans	JL
U. Oklahoma	Integrated
U. Pacific	SL
U. South Alabama	Integrated
U. South Florida	SL
U. Tennessee, Chattanooga	JL
U. West Georgia	Integrated
U. Wyoming	JL
Utah State U.	Integrated
Virginia Commonwealth	Integrated
Winthrop U.	JL

Table 1 : Universities List having Computer Ethics as a course[14]

FOL: Freshman level

JL: Junior Level

SL: Senior Level

SOL: Sophomore level

Stanford University since late 1980's made computer ethics a compulsory course for undergraduate computer science and included it as "CS201 (Computers, Ethics, and Social Responsibility)". Its syllabus is as shown in figure 1:

- Technical ethics (the Manhattan Project)
- Orthodox ethical philosophy
- “Two Cultures” essay of C. P. Snow
- Perils of computing technology
- Intellectual property
- The ethics of “hacking”
- Internet ethics
- Social networking ethics
- Civil liberties and privacy in cyberspace
- Computers and the workplace
- Social issues in system design
- Computing and gender
- Utopian/dystopian visions of technology
- Codes of ethics

Figure 1: CS201 Syllabus[15]

CS201 besides a proper course material has set of assignments and final project. The first assignment asks students to use internet to do thorough analysis of software failures and its ramifications. Students are asked to find a topic on Peter Neumann’s RISKS pages and the supplementary available compilation of computing catastrophes [16][17]. After 2008-09 CS201 is offered as “CS181: Computers, Ethics, and Public Policy”. The student projects for year 2010-11 and is listed in figure 2 along with a link for all student projects from the year 1995-96.

- American Skilled Immigration Policy
- Anonymity on the Internet
- Bitcoins
- Code and Other Laws of Cyberspace
- Computers and Robots: Decision-Makers in an Automated World
- The Culture of Free
- Digital Currencies
- Downloading Consciousness
- Economies of Virtual Worlds
- Entrepreneurship @ Stanford
- The Ethics of Genomics
- Foreign Reaction to China’s Great Firewall
- Free Speech vs Maintaining Social Cohesion
- Freedom of Digital Information in the Middle East
- Google Books
- Hacktivism: Democratic or Destructive?
- Hidden Costs: The Impacts of Technology on the Environment
- iMonopoly
- The Impact of Tablets on Information Availability

- Improving Software Quality
- Journalism in the Digital Age
- Leeroy Jenkins: Free Speech in Online Video Games
- Limitations of U.S. Internet Infrastructure
- Location Privacy
- Micropayments: A Viable Business Model?
- Multinational Software
- Net Neutrality
- Press Freedom for Bloggers
- Privacy and Social Networks
- Project ALADDIN
- Psychology of Trust on the Internet
- Reliability of the Cloud
- Singularity
- Smart Phones and Economic Development
- Solving the technology brain-drain in Asia-Pacific
- Stanford Privacy: Updating Privacy Issues at Stanford
- Technology and Communism
- The Technology of the Future: Near Field Communication
- Technology Trends in Latin America
- Transhumanism: Rise of the Techno Sapiens
- Virtual Worlds: Living in the Machine
- WikiLeaks and Whistleblowing
- Worse Is Better Considered Harmful

Figure 2 Student projects from 2010-2011.

Projects from 1995-96 are available at:

<https://cs.stanford.edu/people/eroberts/courses/cs181/>

IV. WHO'S JOB IS COMPUTER ETHICS

Computer ethics as multidisciplinary subject creates two scenarios regarding its teaching in a computer science department: Should philosophers or computer scientists teach it. The huge and ever increasing literature on computer ethics reflects supporters of both, e.g. Deborah Johnson favoured philosophers to teach computer ethics courses [18]. Johnson argued that “whoshould teach computer ethics courses?” should be decided by following objectives:

- 1) “to make students (especially future computer professionals) aware of the ethical issues surrounding computers;
- 2) to heighten students’ sensitivity to ethical issues in the use of computers and in the practice of computing professions;

3) to give students' more than a superficial understanding of the ways in which computers (do and don't) change society and the social environments in which they are used;

4) to provide conceptual tools and develop analytical skills for sorting out what to do when in situations calling for ethical decision making or for sorting out what the likely impacts computer technology will have in this or that context" [18, p. 6].

She thus proposed that the philosopher with the help of computer scientists are appropriate for teaching computer ethics. However, she later acknowledges the fact that if computer ethics is taught by faculty belonging to computer science that may have positive effects on the students.

Gotterbarn argues that computer science students, besides ethics have three prerequisites:

- a) "that there are ethical issues relevant to their professional practice,"
- b) "how to recognize these issues," and
- c) "how to make decisions which address these issues" [19, p. 13]

Gotterbarn strongly believes that computer science faculty should teach computer ethics as "Philosophers and theologians are concerned with the theoretical complexity of ethical issues, but such complexity can largely be ignored in concrete applications and case discussions. When dealing with professional issues, the fundamentals of ethical theory required as background are within the reach of every faculty member. Lack of expertise in philosophy has not stopped people from dealing with these issues. We all have to act in the world, whether or not we are trained philosophers" [20].

Dianne Martin [21] also objected to Johnson and argues that computer science students should not deal with broad ethical contemplations and general ethical theories, rather they have to deal with ethical issues pertaining to their professional practices and the ethical repercussions of particular technological matter [21, pp. 7–8]. Martin further reiterates that ethical issues pertaining to particular technology issue may not be "fully developed and understood" by philosophers and ethicists lacking knowledge and training of computer science [22]. She argues that "...do they really believe that philosophers... can truly understand the social and ethical implications of encryption key escrowing without understanding the underlying technology of data encryption? Or issues of intellectual property without understanding how the worldwide web (and even the Internet itself) really functions?" [23, p. 2]

We also believe that computer ethics is a job of computer scientist (See Juneed, et. al., 2017, "Computer Ethics: Job of Computer Scientist"). Computer science students must see a computer science teacher as a role model for application of ethics, deliberating ethical issues pertaining to computer science professionals and for their analysis. Computer ethics has to be within a computer science department." Faculty members will be much more motivated to improve their understanding of ethical theories and their ability to manage discussion-oriented classes if professional ethics is considered a legitimate sub-discipline when salary, promotion, and tenure decisions are being made.... Again, the integration of professional ethics into the rest of the curriculum is more likely to occur if scholarly work in this area is valued by the department" [24]. As suggested by Bynum that, "Computer ethics could not be considered 'something extra,' an afterthought to be 'added on' to the curriculum" [25].

V. HOW TO INTEGRATE COMPUTER ETHICS INTO COMPUTER SCIENCE CURRICULUM

Computer ethics can be integrated into computer science curriculum by multiple ways: [26][27][28][20]

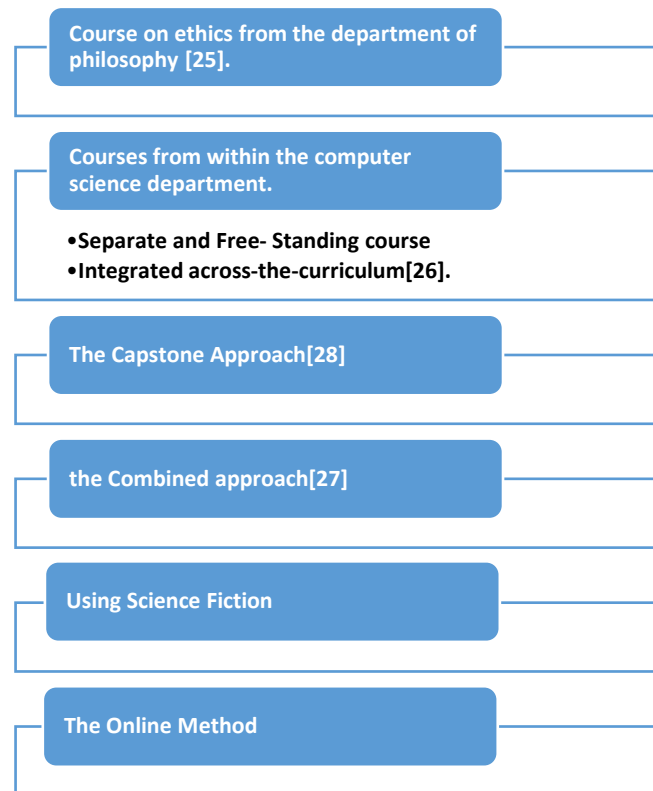


Figure 3: Methods of integrating computer ethics

Separate and Free- Standing course:

Computer ethics to be taught as a separate and free- standing course is advocated by many scholars: Teachings of computer ethics topics can be complete and deeply covered[28][27]. But this approach may be counterproductive as the goal to achieve by computer ethics will be lost. Computer ethics will become a one course which students just want to qualify, but the objective to create ethical engineers will no longer be accomplished. Students will get an impression that rest of the course and faculty has nothing to do with computer ethics.

Integrated across-the-curriculum:

Integrating computer ethics across curriculum is for countering the scenario created by separate course approach where students get impression that computer science subjects and ethics are different entities: In algorithms, machine learning or programming we deal with computer science and in ethics course we tackle ethical aspects. “An obvious alternative is to spread the topic throughout the computer science curriculum. This would avoid the separation problem. It also has the advantage of introducing student to the importance of wrestling with ethical challenges early in their college education then allowing for continued discussion over a period of years”[29]. This approach is most difficult as computer ethics has to be interlaced across the curriculum to cover everything without overlap; this approach also needs competent faculty to teach computer ethics with regular computer science. Computer ethics has to be as rigorous as computer science itself, which requires all-encompassing organisation and synchronisation. Staehr believed this approach as most relevant but seeing the incompetence of computer science faculty doubted that students may not be properly taught[30].

The Capstone Approach:

Gotterbarn suggested a "capstone" course in computer ethics as a late course. He deferred computer ethics to last part of course as he believed student first need to attain professional skills later capstone courses "can (1) tie together elements from all the theoretical courses, (2) convey a sense of professional responsibility not covered in other courses, and (3) deal with the true nature of computing as a service to other human beings"[20].

The Combined Approach

The capstone approach which defers computer ethics to "the end of the students' academic year might be too little too late"[29]. In 1999A combined approach was given by Martin and Weltz[31] :

- primer of computer ethics in the early years of graduation as a separate course;
- computer ethics discussion throughout the course;
- capstone course.

Using Science Fiction

New trend is in its evolution to teach computer ethics using science fiction which has its own set of advantages:

- Instant appeal to students and faculty.
- Encourage evolution of ethical imagination.
- Help to advance skills; writing and verbal in ethical depiction.
- Offers a flexible approach for computer ethics course by enabling teachers to integrate ethics to the technological topics in a best possible way[32].

Science fiction may prove to be an effective means to apply case studies where students discuss the pertinence and consequences of decisions made in a safe, but conceivable, imaginary ecosphere[33].

The Online Method

Computer ethics can be taught by online asynchronous virtual classroom with few changes in didactic doctrines for effective teaching and learning[34]. For Example online approach need more teaching time and creative approaches to influence students[35]. In online setting misinterpretations and miscalculations are bound to occur due to the lack of facial expressions, so emoticons are used to complement the verbal and facial signs[36]. Online approach has many advantages for teaching computer ethics like students can access the discussion boards without time or place constraints, as they can be part of it at anytime and anyplace. Students also has choice for amount of time they required to reflect and respond[37]. online method gives students a chance for independent learning by exploring the internet for sources of information[36].

VI. WHAT TEACHING PARADIGM TO APPLY

For students to have perceptive, motivational, and cognitive outcomes in computer ethics classroom we can adopt constructivist and didactic instruction paradigms. Didactic paradigm imitate the developmental philosophy; viewing students' brains as hollow containers to be packed by the knowledge from the teachers[38]. Didactic paradigm is teacher oriented offering conceptions as the definitive facts thus barring students to use their cognitive skills

and reasoning[39]. Constructivist paradigm believes in the construction of knowledge by the students themselves[38]. This paradigm is student oriented getting them in a zone where they can analyse computer ethic issues from different viewpoints. Teachers facilitate the didactic process without dominating the process itself, rather allowing students to participate actively to use their cognitive skills and apply reasoning to build knowledge. Constructivist paradigm is better suited to teach computer ethics than didactic paradigm as it avoids indoctrination and boost computer ethics education. Constructivist paradigm to teach computer ethics is proposed by almost all of the scholars “such as experiential learning, critical thinking and collaborative learning”[40][41][34][42].

VII. WHAT FRAMEWORK TO APPLY

From as early as 1960 ACM is working to create curricular documents, updated one after other[43]. Going in the same direction in 2017, the ACM and the IEEE Computer Society assigned thirty-six specialists from sixteen countries and six continents (Asia, Africa, North and South America, Europe, and Australia) to take computing education to the next level from CC2005 to CC2020, for the creation of The Computing Curricular 2020. The project will be “competency –based” taken from IT2017 report[44]. Previous models were primarily on body of knowledge, but CC2020 which is based on IT2017 report adds skill, and disposition with knowledge as three interconnected dimensions. We have a three-dimensional competency-based model for computer ethics as its framework.

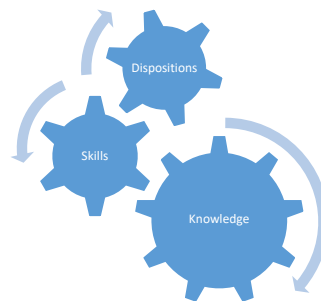


Figure 4 : Competency Model adopted by CC2020

VIII. CURRICULUM DESIGN?

Computer scientists, scholars, academicians and computer organisations like ACM, IEEE etc. had been working on computer ethics curriculum for so long. ACM’s Curriculum ’78[45] recommended computer ethics inclusion in core lower-division as well as in upper division of computer science courses. Numerous institutions over many years have toiled to find mechanisms to integrate computer ethics into their curricula making it more pronounced, as is quite apparent by the Casey Fielder’s growing list of 224 courses with substantial technology ethics material[46].

Taking into consideration curriculum guidelines for recommendations pertinent to computer ethics we consider:

- a) The ImpactCS Ist[6], 2nd[47], and 3rd[31] final Reports.
- b) ACM Computing Curricula Recommendations 2001-present[43][48].
- c) The Royal Academy of Engineering’s Curriculum Map[49].

All of the above recommended following:

- Computing history in ethical domain.
- Professionalism

- Ethical analysis.
- Philosophical perceptions.

The integration of ethics and social issues in computer science curriculum can be understood by three reports of ImpactCS project. First report added tenth subject, second report added five knowledge units and third report gave “a pedagogical rationale and models for integration of the material with the existing curriculum”[50].

The five knowledge units added by 2nd Report of the ImpactCS[47][31] as the foundation for Computer science curriculum is listed in figure 5.

IX. COMPUTER ETHICS INDIAN PERSPECTIVE AND CURRICULA DEVELOPMENT

In India regarding computer ethics there is a huge conceptual vacuum. Computer ethics is either absent or present in a dismal form. India is becoming a software hub for world as software development industry is at full bloom. Thus, it is very important to integrate computer ethics at the university level of education and to map with the industry standards.

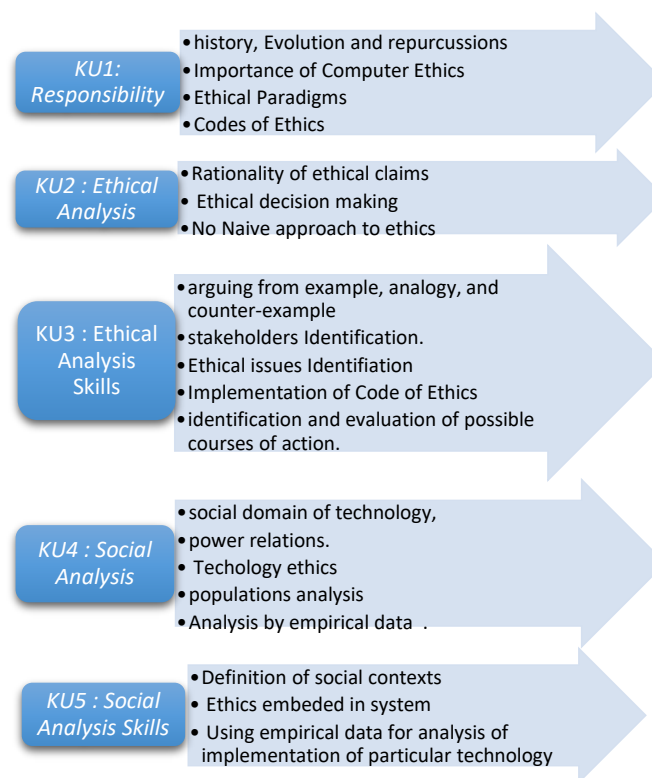


Figure 5: Five Knowledge Units(KU)

Globally many countries have initiated licensing for software engineers[51] with accreditation focusing on curricula; India to compete at global level need to make critical reformation in their curricula such that students think critically and prepare themselves for professional practices. It is also important to have in mind the following “harmonizing elements:

- *principles*: lasting concepts that underlie the whole field;
- *practices*: problem-solving techniques that good professionals apply regularly;
- *applications*: areas in which the principles and practices find their best expression;

- tools: state-of-the-art products that facilitate the application of principles and practices;
- mathematics: the formal basis that makes it possible to “Understand everything else”[52].

The Curriculum besides technical skills should also impart social competence. The teaching methods which can be put to use are:

- Lectures;
- videos on computer ethics;
- case study;
- assignments;
- class discussions and debates; and
- role play.

Time requirements:

- a) 40 hrs of lectures.
- b) 30 hrs of laboratory
- c) 30 hrs of online study

The content should be didactically motivated and integrated across curriculum into the computer science core courses like programming languages, software engineering, data bases, artificial intelligence, operating systems etc, as a set of modules. with a final “capstone course” putting all professional practices into one package.

Sample modules:

- Cybercrime.
- Computer security.
- Piracy.
- Intellectual property rights.
- Hacking.
- Use and protection from harmful software.
- System and Software failures and consequences
- Privacy protection.
- Social consequences of artificial intelligence and expert systems.
- Professional practises.
- Code of ethics.
- System design and social issues.
- Utopia/dystopian framework of technology

Assignment structure:

Assignments is mechanism which gives students active learning experience. Basic framework of assignments can be writing 4-10 pages on:

- Causes of software failure and consequences.
- Application of traditional ethical theories to computer related ethical issues.
- Policy vacuum and suggestions.

- Civil liberties like free speech, censorship and internet.
- Professional responsibility.
- Liabilities, risk and accountabilities of computer-based systems.

X. HELPFUL RESOURCES TO BUILD THE CURRICULUM

Indian computer science scientists, research scholars and academicians need to work for building and integration of computer ethics in computer science curriculum. Following resources may prove helpful to build such course, develop an integration plan, design assignment structure etc, as per the requirements of Indian didactics. The Internet has an overabundance of resources that can be useful in teaching computer ethics like World-Wide Web, mailing lists, ftp repositories, newsgroups etc [53][54][55][56].

Conferences:

- ETHICOMP – International Conference on the Social and Ethical Impacts of Information and Communications Technologies. *ETHICOMP 2018: ETHICOMP 2018 Tricity, Poland, September 24-26, 2018*
- CEPE – Computer Ethics – Philosophical Enquiry Sponsored by ACM. *CEPE2019 Old Dominion University Norfolk, United States*
- ISTAS – International Symposium on Technology and Society. Sponsored by IEEE. *IEEE ISTAS 2018- Technology, Ethics, and Policy Nov. 13 & 14th, Washington DC*
- ETI – Ethics, Technology and Identity

Journals and periodicals:

- Ethics and Information Technology (ISSN 1388-1957).
- The Information Society: An International Journal (ISSN 0197-2243).
- Computers and Society (ISSN 0095-2737) is a quarterly periodical of the ACM-SIGCAS.
- IEEE Technology and Society Magazine (ISSN 0278-0097) is quarterly periodical published by IEEE-SSIT.
- Computers & Society Newsletter, published quarterly by SIGCAS of the ACM,
- IEEE Technology & Society magazine

Textbooks:

- Computer Ethics (4th Edition) by Deborah G. Johnson.
- Computers, Ethics and Social Values by Deborah G. Johnson and Helen Nissenbaum.
- Computer Ethics and Professional Responsibility by Terrell Ward Bynum and Simon Rogerson.
- Cyberethics: Morality and Law in Cyberspace by R. Spinello.
- The list of earlier textbooks updated on February 9, 1998 as well as a list of additional teaching resources is included in [57].

XI. CONCLUSION

In this paper a framework for integrating computer ethics in Indian computer science curricula was proposed. A combined approach as a teaching methodology was suggested, which guarantees proper integration of pertinent computer ethics topics that will bring professionalism in future IT professionals. Currently Indian universities either lack computer ethics or is in a dismal form. Therefore, there is a big void we must fill. This paper also emphasised that we have a plethora of accessible great resources to formulate a Computer Ethics course for our Indian Universities. So, let's bring it on. Why wait?

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