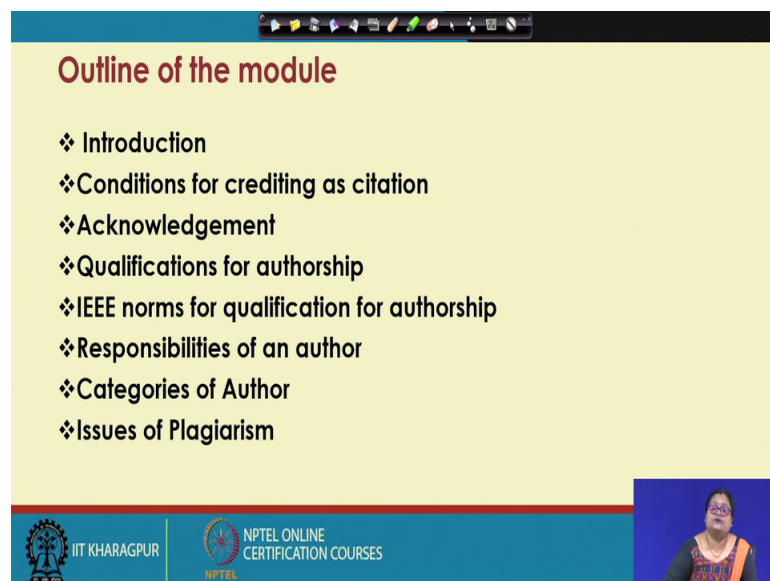**Ethics in Engineering Practice**
Prof. Susmita Mukhopadhyay
Vinod Gupta School of Management
Indian Institute of Technology, Kharagpur

Lecture - 26
Research Ethics (Contd.)

Welcome back in this session we are going to discuss about responsible authorship and credit in engineering research.
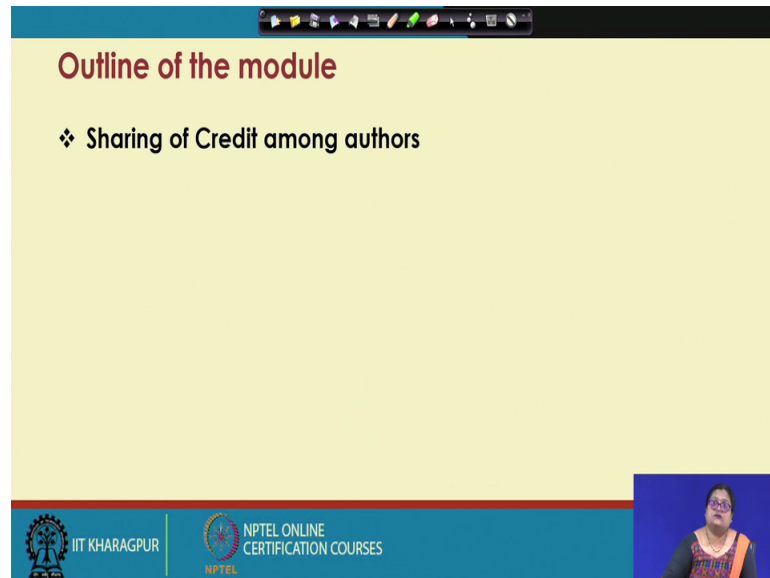
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So, the outline of the module will be like what you understand for crediting as citation, acknowledgement, qualification of authorship, their responsibilities of an author, categories of an author, issues of plagiarism, sharing of credit amongst authors and final aspects with related to it.
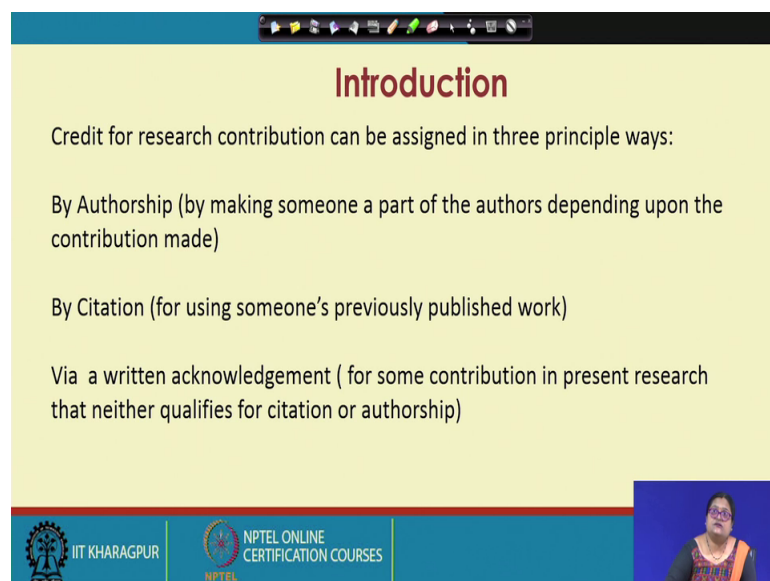
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So, credit for a research contribution can be assigned in three principle ways: by authorship, by citation and via a written acknowledgment.

So, authorship is by making someone a part of authors depending upon the contribution made, citation is for using someone's previously published work and via written acknowledgement means for some contribution in present research that neither qualifies for citation or authorship. So, before we move ahead we can understand this we are again taking as a part of a duty and then obligation to recognize the contribution made by

others in terms of our the work done a contributions made to the research that is being done.

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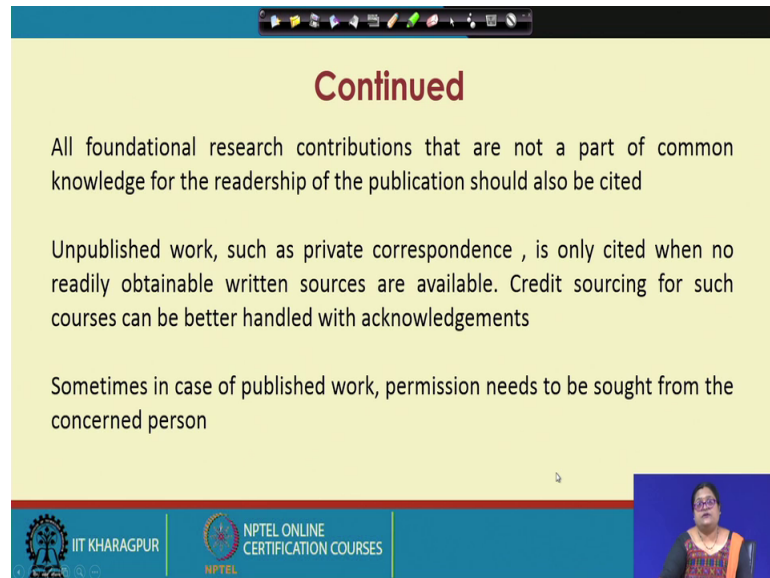The conditions for crediting as a citation are widely accepted criteria for citation in research publications are: in case you drew results or ideas that already appeared in previously published or formally presented in work. Citations should also be made in case references are drawn from any work presented by others at conferences or disciplinary meetings. List of works cited should be sufficiently complete to allow readers to understand where the reported research fits in.

All foundational research contributions that are not a part of common knowledge for the leadership of the publication should also be cited. Unpublished work like private correspondence is only cited when no readily available written sources are available; credit sourcing 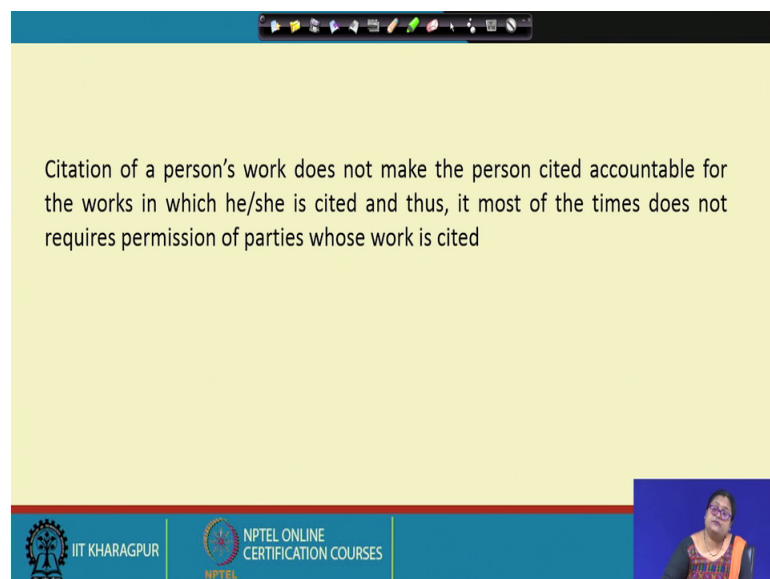for such courses can be better handled with acknowledgements. Sometimes in case of published work, permission needs to be sought from the concerned person this part is very important to understand like; if you are citing someone somebody's work, sometimes permission requires to be taken.
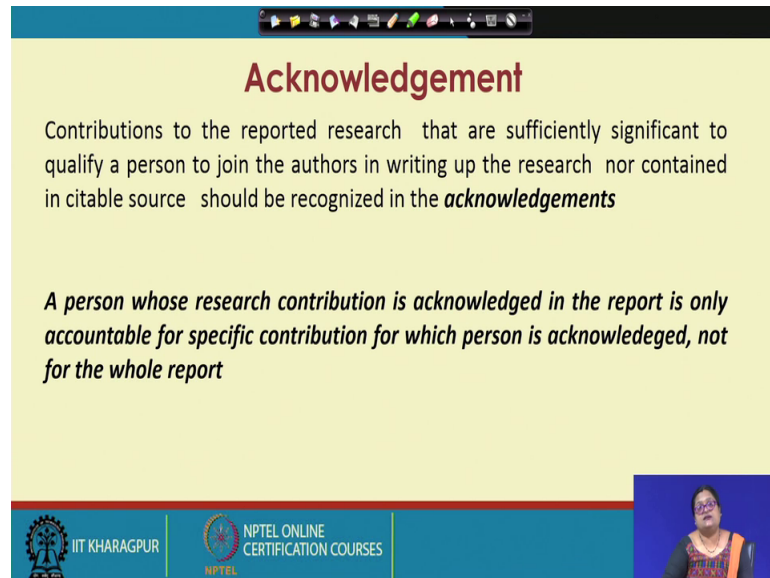
Citation of a person's work does not make the person cited accountable for the work in which he she is cited and thus, it most of the times does not requires permissions of parties whose work is cited. Because, there is no accountability so, of the person who is citing cited for the present works so, sometimes in most cases permission is not required also.

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Now, how citation is different from acknowledgement, contributions to the reported research that is sufficiently significant to qualify a person to join the authors in writing up the research nor containe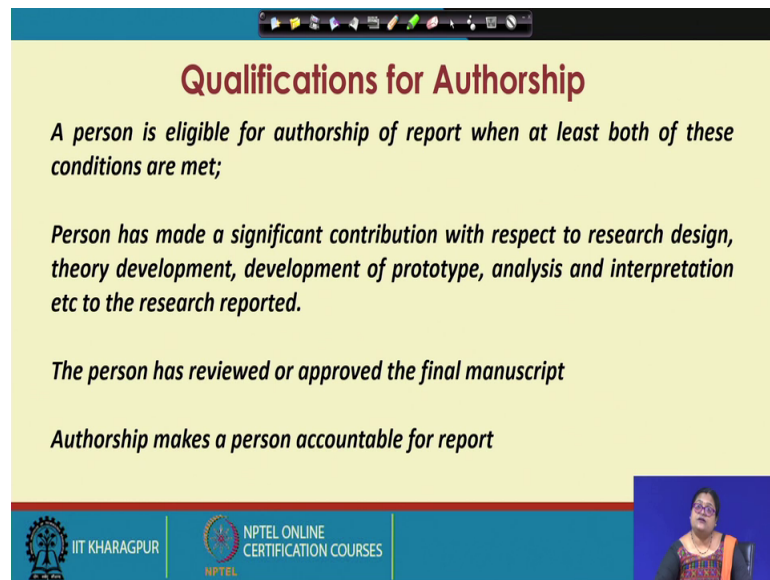d in citable source should be recognized in acknowledgements. A person whose research contribution is acknowledged in the report is only accountable for the specific contribution for which the person is acknowledged not for the whole report. So, we should be very very specific about we are acknowledging whom for what kind of work because, that person is accountable for that specific contribution that is mentioned in the report.
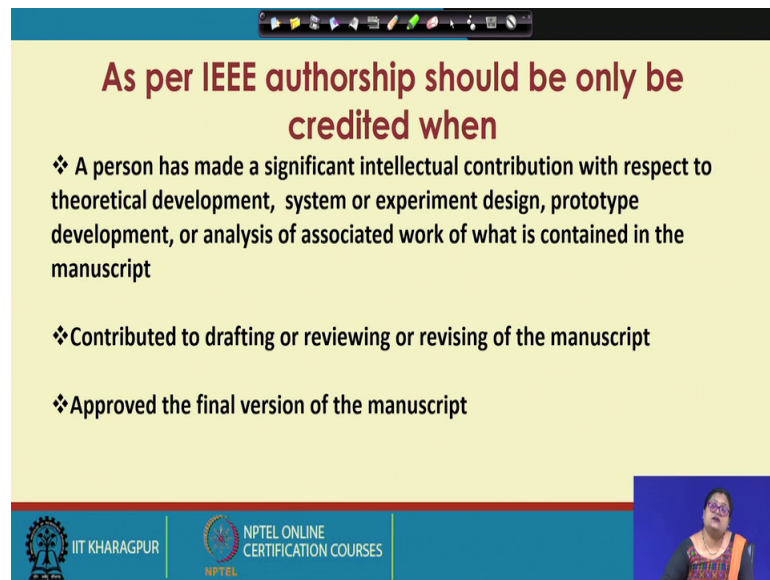
Now, what are the qualifications for authorship? A person is eligible for authorship of a report when at least both of these contributions are met; person has made a significant contribution with respect to research design theory development, development of prototype, analysis and interpretation etcetera to the research reported.

The person has reviewed or approved the final manuscript; authorship makes a person accountable for the report. So, these needs to be clearly understood clear, clear idea needs to be taken like what is the responsibility of the person whose works cited, what is the responsibility for the person who is acknowledged and what is the responsibility of the person who is like authorship and what makes the person what degree of contribution makes the person qualify eligible for authorship? These are may be final discussion which needs to be that we need to be very careful when we enter into collaborating research practices.

So, that if somebody comes and claims for authorship, we have to understand whether that person is eligible for authorship or not or only acknowledging that persons contribution is or citing somebody's work is ok. Like; if we do not know this final details then sometimes it may so, happen, somebody may come and claim for the authorship and we do not know in that case what is appropriate action to be taken should we like recognize the person as the author and give credit for it or not.
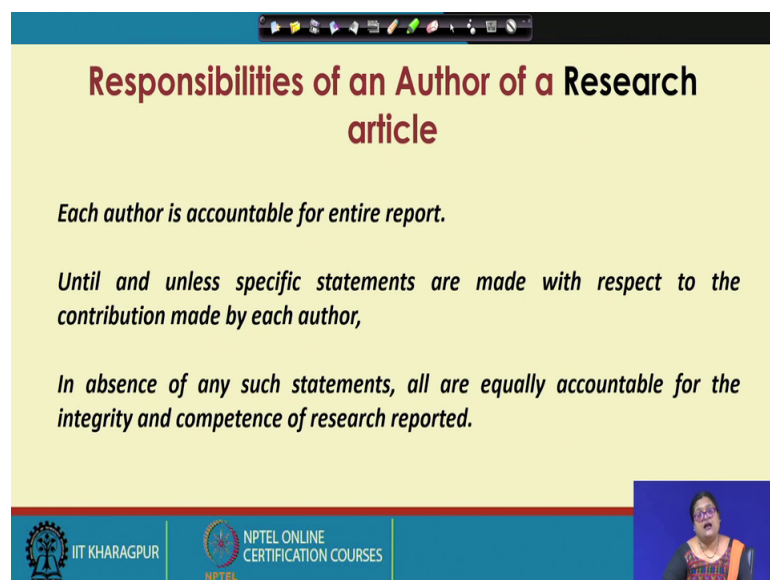
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As per I triple E authorship should be only be credited when a person has made a significant intellectual contribution with respect to theoretical development, system or experiment design, prototype development, or analysis of associated work of what is contained in the manuscript. Contributed to drafting or reviewing or drafting or reviewing or revising of the manuscript approved the final version of the manuscript.

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What are the responsibilities of an author of a research article? Each author is accountable for the entire report until and unless specific statements are made with
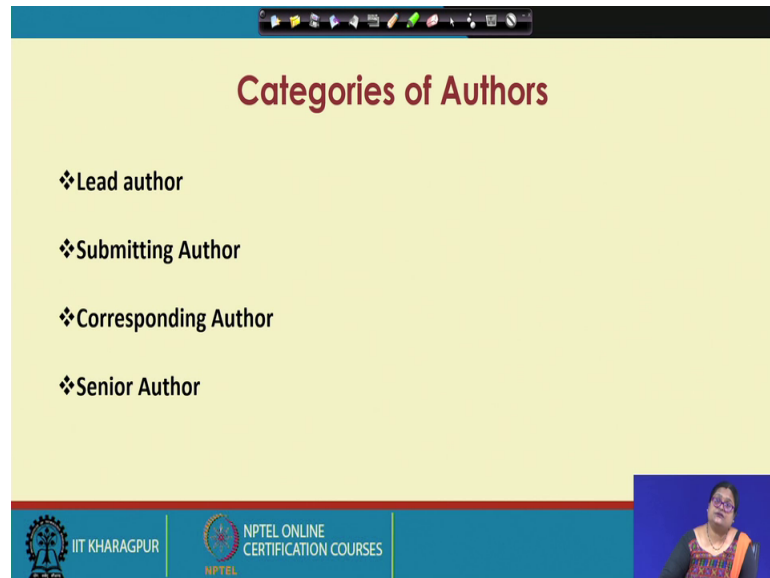
respect to the contribution made by each author. In absence of any such statements all are equally accountable for the integrity and competence of the research reported.

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Now, we have to understand clearly what are the categories of authors? So, who qualifies to be the first author, who qualifies to be the second author there could be sometimes what happens controversies regarding like suppose you are working in under your guide. So, who becomes a first author and who becomes the second author? So, there this could be some controversies regarding it. So, there were different categories of authors like; lead author, submitting author, corresponding author and senior author.

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Let us see what are these differences? Lead author holds the principle responsibility for the work is the one who has made the greatest intellectual contribution to work, bears responsibility for whole report, even if others specified contributions are specified.
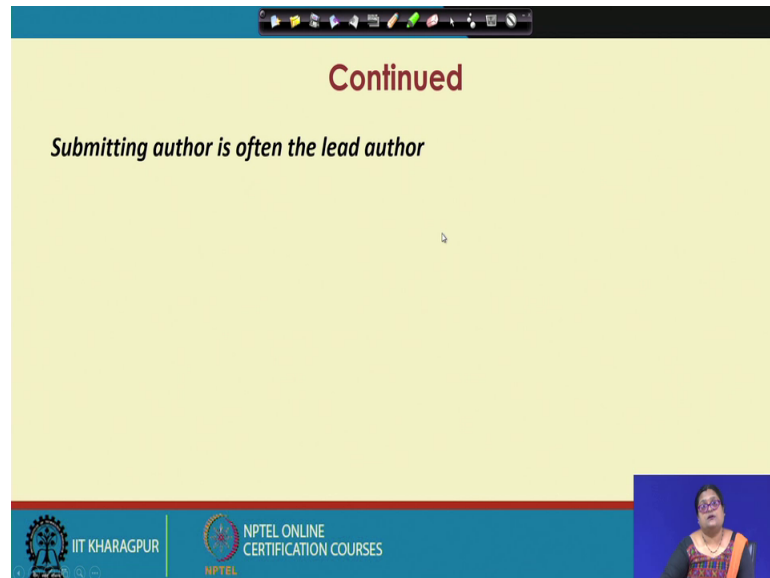
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Submitting author is one who submits the manuscript, deals with journals editors, only points of correspondence, owns a special responsibility to see that all authors have fulfilled the criteria for authorship, make sure that the special journal requirements are

met. So, these author tries to correspond to and fixed maintain like all the criteria with respect to the journal publication has been met or not.
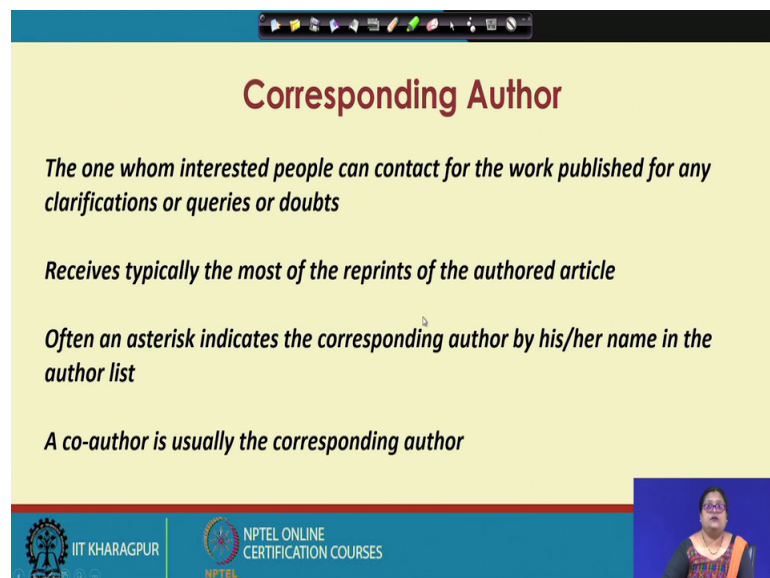
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So, sometimes would happens submitting author is the lead author.

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Corresponding author; is the one whom interested people can contact with the work published for any clarifications requiring or doubts, receives typically the most of the reprints of the authored article, often an asterisk indicates the corresponding author by his or her name in the author list, a coauthor is usually the corresponding author.

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Senior author; it is an ambiguous term which talks of did sometimes talks of the lead author or the senior most author; who is in the highest academic rank or of the greatest reputation in the field.

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One of the major issue is of course, plagiarism it is generally understood to be the appropriation of another person's ideas, processes, results or words without giving any proper credit. It is considered as a serious research misconduct it just does not apply to text, but also to graphics representations such as photographs, tables and charts as well.
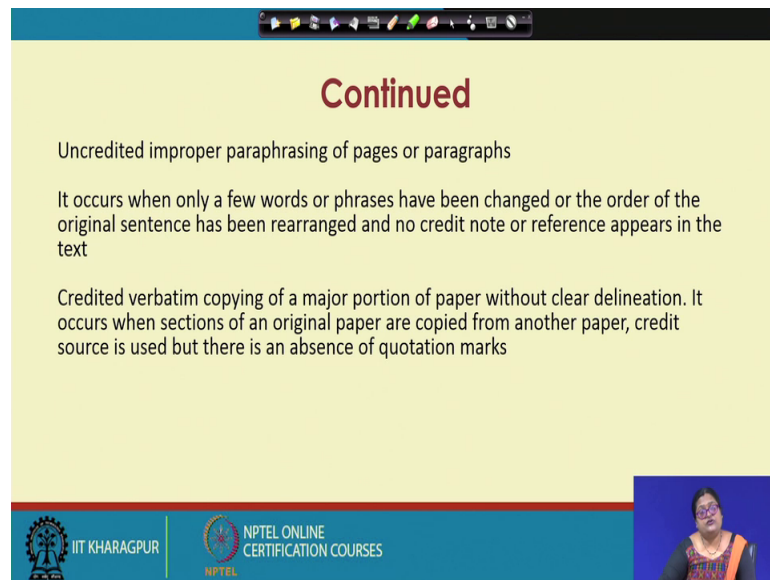
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What are the technical qualifications for plagiarism? This is very important which needs to be remembered uncredited verbatim copying of a full paper, uncredited verbatim copying of a large portion greater than 20 percent or up to 50 percent, uncredited verbatim copying of individual elements like paragraphs sentences or illustrations.

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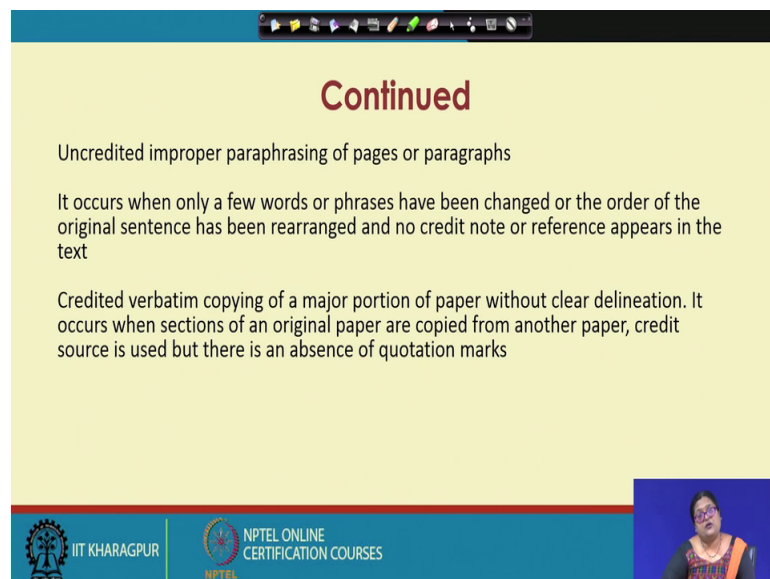Uncredited improper paraphrasing of pages or paragraphs, it occurs when only a few words or phrases have been changed or the order of the original sentence has been rearranged and no credit note or reference appears in the text, credited verbatim copying

of a major portion of paper without clear delineation. It occurs when sections of an original paper are copied from another paper, credit source is used, but there is an absence of quotation marks.
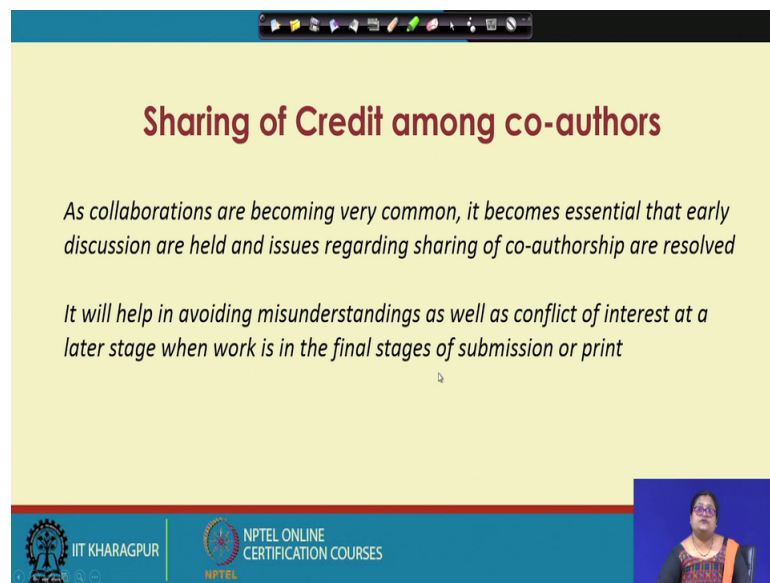
So, that original text and the new text gets merged together and like we are not able to find out like which is the contribution of the present author and what is the contribution of the earlier author who has been referred.

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So, because there is no credit given by putting of like the either in terms of apostrophes or brackets so, that we can understand this portion is by the original author or quotations.

So, how do we share credit amongst coauthors; as collaborations are becoming very common, it becomes essential that early discussion are held and issues regarding sharing co authorship are resolved. It will help in avoiding misunderstandings as well as conflict of interest at a later stage so, when it is in the submission or in a print state.

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So, what are the things which will be a some like final issues will be the determination of the order of authors so, how do you determine is?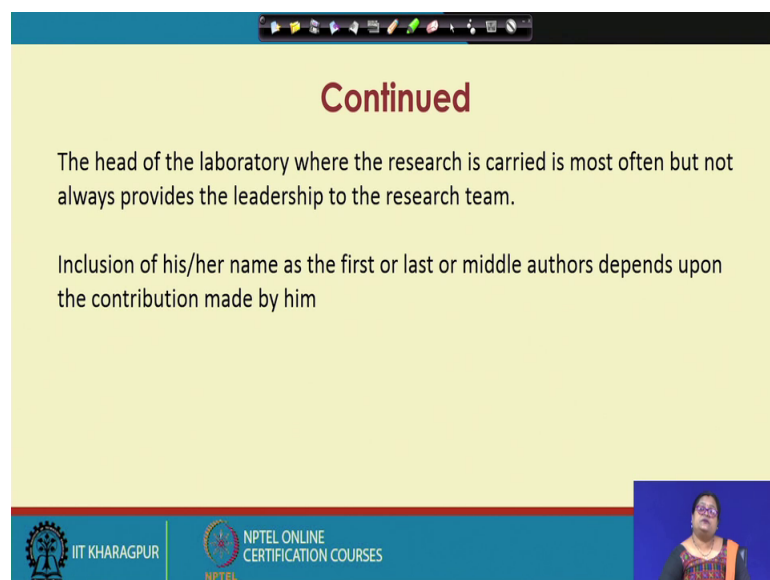 First author is usually the lead author the lead author is usually indicated by keeping his name as the first author. Last author whose name appears as last in the manuscript usually implies the author who has made the least contribution so, it is in order of importance sort of.

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The head of the laboratory where the research is carried out is most often, but not always provides the leadership to the research team. Inclusion of his or her name in as the first
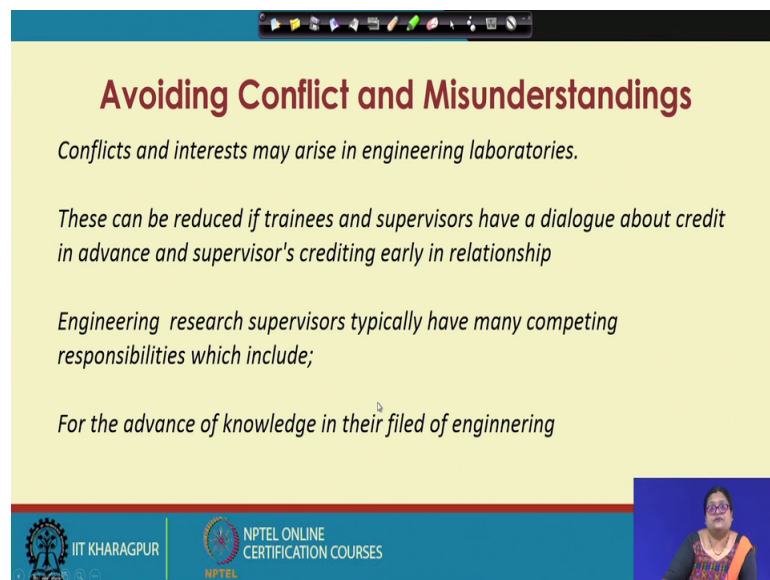
last or middle authors depends upon the contribution made by him. So, what person could be the head of the laboratory, but by crediting the person for authorship we need to understand the contribution made by that person directly into the research and amount of contribution made.

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So, what can be done to avoid conflict and misunderstandings so, conflicts and interests may arise in engineering laboratories, these can be reduced if trainees and supervisors have a dialogue between credit between themselves about credit in advance and supervisors crediting early in relationship. Engineering research supervisors typically have many competing responsibilities which include; like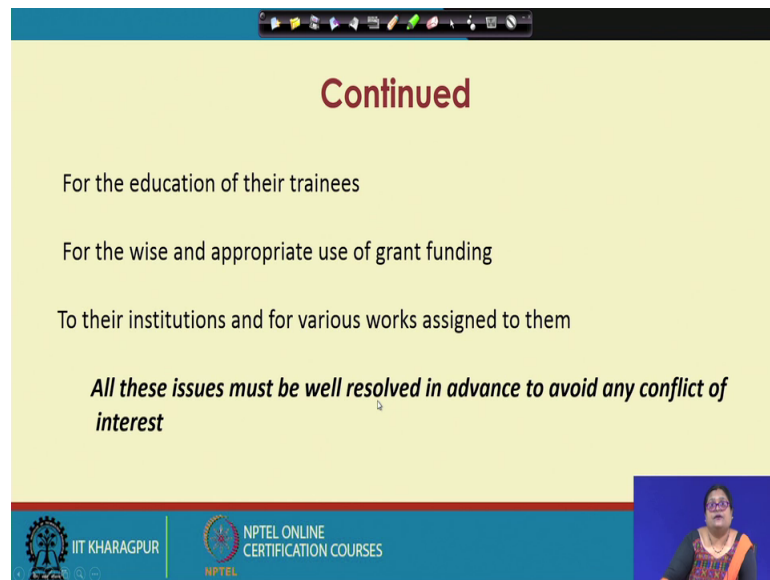 the for the advance of knowledge in their field for engineering, then for the educational their trainees for the wise and appropriate use of grant funding for their institutions and various works assigned to them.

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So, because they have so, many of different assigned roles and interests. So, to avoid any conflict from issues may be resolved were in advance. So, these are the some of the important points which we need to understand as a part of like engineering is today it is not only about just practices. But it is also disseminating your knowledge to the outside world to the other people, who are working on the same domain and sharing of your findings with each other.

So, when this knowledge sharing is happening, when this knowledge transfer is happening, issues related to these authorship issues related to plagiarism, issues related to data collection and reporting of results becomes important. And if we keep in mind the discussion of today then, it is definitely going to help us to avoid unethical practices and maintain the research integrity.

Thank you.