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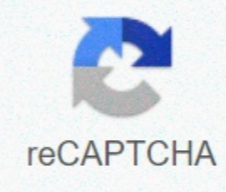
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Computer integrated manufacturing class

By Prof. J. Ramkumar, Prof. Amandeep Singh IIT Kanpur Using computers in manufacturing in order to design and develop the products has found unprecedented applications. The integrated form of computer manufacturing provides a variety of benefits, including speed, flexibility and better control. This course discusses computer-integrated manufacturing (CIM) approaches. CAD/CAM tools and their production systems and within and between them are presented together with appropriate case studies. Data storage and manipulation is also the need for contemporary manufacturing systems. This is also served using software tools. The course is reinforced with laboratory demonstrations to add a touch of practitioners. Students would develop a skill in planning, designing and largely developing a product and production system after completing this AUDIENCE INVOLUNTIDA course: Students from all Disciplines of Engineering and Science. PREREQUISITES : The student must have completed two semesters of the UG Engineering or Science ug program. INDUSTRY SUPPORT : HAL, NAL, SAIL, ENrolled ISRO Students: 4949 Week 1 : Introduction to Computer Integrated Manufacturing (CIM)Week 2 : Computer Helped DesignWeek 3 : ManufacturingWeek 4 Assisted Computer : Computer Numerical ControlWeek 5 : Computer Aided Process Planning (CAPP)Week 6 : CIM CAD Interface vs CAMWeek 7 : Data and information in CIMWeek 8 : Manufacturing systems and their designSerest 9 : Simulation of manufacturing systemsThe week 10 : Assisted ComputerMaintenanceWeek 11 : Additive Manufacturing Integrated by ComputerWeek 12 : Advanced techniques CIM 1. Chang, T.C. and Wysk, R.A., 1997. Computer-aided manufacturing. Prentice Hall PTR.2. Xu, X., 2009. Integration of advanced computer-aided design, manufacturing and numerical control. Information Science Reference.3. Groover, M.P., 2007. Automation, production systems and computer-integrated manufacturing. Prentice Hall Press.4. Weatherall, A., 2013. Computer-integrated manufacturing— from fundamentals to implementation. Butterworth-Heinemann.. IIT KanpurDr. Janakarajan Ramkumar is Professor of the Department of Mechanical Engineering, and Design Program, at the Indian Institute of Technology, Kanpur. He teaches manufacturing science, micro/nano technology, new product development. He holds a bachelor's degree in Production Engineering with his phD in defect quantification in compound drilling from IIT Madras, India with a best thesis award. Over the years his contribution in teaching and research is remarkable. He has worked for the BOSCH group and has improved the productivity of the company. research and teaching focus on nanotechnology and inclusive design. He holds several international and national patents on his credit and has published more than 100 articles from Dr magazines. Amandeep Singh is working as a Research Scientist in the Department of Mechanical Engineering, and the Design Program, Indian Institute of Kanpur, India. He holds a phD from the Indian Institute of Technology Kanpur, India, and a bachelor's degree in Production Engineering. Dr. Singh has ten years of industrial and academic experience. His research interests are Sustainable Manufacturing Processes and Systems, Simulation of Manufacturing Systems, Product Design and Manufacturing, Applied Ergonomics and Engineering Metrology. He has traveled through countries such as the United States, Canada and Australia to present his research at various international conferences organized by renowned organizations such as CIRP and IEOM. His research is also published in several renowned international journals. COURSE CERTIFICATE • The course is free to enroll and learn from. But if you want a certificate, you have to register and write the supervised exam taken by us in person at any of the designated test centers.• The exam is optional for a fee of Rs 1000/- (Rupees thousand only).• Date and time of the exams: April 26, 2020, morning session 9am to 12 noon; Afternoon session 2pm to 5pm.• Enrollment url: Announcements will be made when the registration form is open for registrations.• The online registration form has to be filled out and the certification exam fee must be paid. More details will be published when the exam registration form is published. If there are any changes, it will be mentioned then.• Please refer to the form for more details about the cities where the exams will be conducted, the conditions you accept when filling out the form, etc. CRITERIA TO GET A CERTIFICATE:• Average allocation score: 25% of the average of the best 8 assignments of the total of 12 assignments given in the course. • Test Score: 75% of the 100• Final Score - Average Assignment Score + YOU Test Score will BE ELIGIBLE FOR A CERTIFICATE ONLY IF THE AVERAGE ASSIGNMENT SCORE >-10/25 AND THE EXAM SCORE > 30/75. • If one of the 2 criteria is not met, you will not get the certificate even if the final score > 40/100.• The certificate will have your name, photograph and score on the final exam with the breakout. It will have the NPTEL and IIT Kanpur logos. It will be verifiable nptel.ac.in/noc.• Only the electronic certificate will be made available. No hard copies will be sent. FOLLOW THE U.S. Privacy Policy Terms of Use ? Honor Code (Honor Code) SWAYAM FAQ Helpline / Support Skip Last Minute Start Search Forums (no announcements have yet been posted.) Skip the latest ads (no ads have yet been served.) Skip upcoming events No upcoming eventsSosOps recent SAMPLE OUTLINE COMPUTER INTEGRATED MANUFACTURING (COURSE OUTLINE) Instructor: Dr. K. SAHUBatch :P GP II (199?-9?) TERM : V or VI OBJECTIVE : Computer Integrated Manufacturing (CIM) is a strategy that involves almost all major functional departments of a modern manufacturing company. It is rapidly evolving towards a that can guarantee the maximum efficiency, quality, flexibility and profitability of a company. It is therefore essential that modern managers, especially in a developing nation like ours, understand the applications of advanced technologies in manufacturing, and appreciate their business impact on the competitive dimensions of cost, flexibility, quality, and delivery capacity. COURSE CONTENT: Production Economics - Justification of Automation Computer Aided Computer-Aided Manufacturing Design (NC/CNC/DNC) Robotic Automated Materials Handling and Storage Group Technology Flexible Manufacturing Systems Computer-Aided Process Planning Integrated Computer Aided Production Management Systems Implementing CIM SEMINAR TOPICS: Integration of Expert Systems and Decision Support Systems integrating D Manufacturing systems and manufacturing systems Integrating systems experts in MIS environments and CIM CIM and Artificial Intelligence (AI) applications Knowledge-based systems in manufacturing domain systems manufacturing systems for AI in 1990s manufacturing (Conference and seminar program to be delivered in class) COURSE ASSESSMENT In addition to the usual conferences , by the instructor, there will be a series of student seminars. Each participant will be asked to thoroughly review and present a relevant literature towards the later half of the period. Students are encouraged to be vigilant during seminar sessions. The ideas and concepts gathered throughout the conferences and seminars will be incorporated into the project proposal (including details) that you will receive at the end of the period. The relevant literature for the seminars will be provided by the instructor. Students are free to do their own literature survey, if possible, to complement the role. The course grade will be determined by the following components: SEMINARS PAPER REVIEW 15% PAPER PRESENTATION 15% PROJECT 35% END TERM EXAM. 35% REFERENCES : Computer-- Design and manufacturing assisted by M.P. Groover and E.W. Zimmers, Jr. Automation, Computer-integrated production and manufacturing systems by M.P.Groover Computer Integrated Manufacturing: From Fundamentals to Implementation by Alan Weatherall CIM Systems : An Introduction to Computer Manufacturing by Mitchell (1991). Computer Aided Design in Manufacturing, by Valliere (1991) Computer Integrated Manufacturing : An Introduction with Case Studies, ranky (1992 or latest) Computer Integrated Manufacturing : Data Management Strategies, by Bray (1992 or newer) Computer Aided Manufacturing, by Chang-Wysky-Wang (1991) FMS/CIM System Integration Handbook, by Miller - Walker (1989 or latest). Cells and systems luggen (1991) or newer). Project (PROPOSAL) . . CIM system for your company (choose any company you've worked as an apprentice or employee). You are prompted to write a PROPOSAL. It would help if I could address the following issues when writing the proposal. BUSINESS PERSPECTIVES FOR CIM What are your company's business objectives? Specify your company's main products and market share of these products. How are they likely to change over the next five years? What are the main characteristics of your company's products that set them apart from the competition? Consider a business problem in your workplace, one that personally causes you pain. List the people and departments that contribute or suffer from this problem. For each entry in this list, identify what you think your attitude to the problem will be and how important the issue is to them. From this, can a business case be defined to solve the problem that takes into account the concern of all stakeholders? Consider the computer terminal you used most recently (business, not privately owned) and evaluate how (and/or the system you were connected to) may have been justified by cost, who might have done the calculations, and who you think approved the investment. Do you think it was a profitable investment? ANALYSIS OF MANUFACTURING SYSTEMS AND COMPUTER SYSTEMS analyze the current manufacturing system. How has it been affected by computerization? What are the various islands of computerization? Discuss available automation hardware and software. Discuss existing computer databases. Is it extensive? Does it include the following: item and structure data, engineering modification data, vendor database, purchase orders, customers, sales orders, routing data and work centers, etc. Anything else? Does the IS (Information Systems) department extend control to PCs and plant networks? MANUFACTURING INFORMATION FLOW Shows the flow of information in your company. (Also focus on the flow of information in the workshop.) Discuss the areas of higher cost and complexity that arise by changing the components of a product when it is in the process of manufacturing; related to the flow of information from design to development to process planning and manufacturing. COMPONENTS OF A CIM ARCHITECTURE Now, draw the ultimate CIM system for the company you work for, i.e. report everything that is not yet computed and link all existing equipment. How many new computer systems are required and how many different computers need to be connected to each other? PRODUCT DESIGN AND PROCESS FOR CIM Discuss the benefits of automated planning of compared to traditional manual systems. What are the differences between recovery and the generative process planning system? Can you use GT to classify products manufactured by your company into part families? You don't need to get into Just give a few examples. PLANNING AND CONTROL IN A CIM ENVIRONMENT For the company you work for, plot as a histogram the frequency of deliveries per vendor (e.g. hourly, twice daily, daily, twice a week, weekly, etc.). What does this say about how close or far your JIT production company is? Low stock levels are a priority of most manufacturing companies, a solution that is not necessarily the most economical, but at least measurable. Do you think CIM systems could develop such precision in controlling the capacity and flow of materials that, in a controlled manner, stock levels could be allowed to rise again? AUTOMATION AND SMART MACHINES TODAY: Discuss why GT has been so influential in the design of today's factories. Identify the benefits and opportunities it offers and the limitations it imposes. CUSTOMER/SUPPLIER COMMUNICATION Consider the flow of information between an advanced technology product manufacturer and a supplier of a component item, i.e. the vendor is likely to suggest design changes to the component, and these changes may affect other components of the product. What data should pass between the two companies and how it would be added. change to be controlled? How would this communication be affected if different CAD systems were used? Back to Dr. Sahu's home page