

PhD in INGEGNERIA MECCANICA / MECHANICAL ENGINEERING - 40th cycle

THEMATIC Research Field: MANUFACTURING SYSTEMS ENGINEERING

Monthly net income of PhDscholarship (max 36 months)

€ 1500.0

In case of a change of the welfare rates during the three-year period, the amount could be modified.

Context of the research activity	
Motivation and objectives of the research in this field	Semiconductor Fabrication is one of the most complex production activities created so far. The number of production steps is in the order of hundreds, there are reentrant flows and time constraints involving different operations, quality requirements are extremely high, many different products with different recipes are produced having different quantities and delivery dates. Therefore, it is an extremely challenging task to design and manage FABs. The objective of the proposed research is to model segments of the production environment to devise appropriate production planning methods and to propose system design methodologies.
Methods and techniques that will be developed and used to carry out the research	One of the main problems when dealing with complex production systems is that their performance is highly dependent on the way the system is managed, i.e. on the characteristics of production planning. Currently available methodologies do not allow to take into account system management at design stage therefore the resulting design may be suboptimal. To overcome this limitation, production planning methodologies have to be integrated with system design methodologies. This will be done by means of response curves obtained by using production planning on various system designs and by optimizing the solution using hyperplanes.
Educational objectives	The student will:

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	 Understand the problems related with management of chip fabrication in FABs Analize real cases and cases available in the literature on chip fabrication and the related FABs Develop production planning models for segments of chip fabrication process Develop response curves on the performance of the system under analysis Develop optimization tools to improve the configuration of the of the FAB under analysis
Job opportunities	 Management and design of FABs for chip fabrication Production planning and control in fabrication of complex products in various sectors (e.g. automotive, aeronautics, electronics, mechatronics, healthcare) Design of manufacturing systems for complex products in various sectors (e.g. automotive, aeronautics, electronics, mechatronics, healthcare) List of Universities, Companies, Agencies and/or National or International Institutions that are cooperating in the research include: University of Texas at Austin, KAIST (Korea Advanced Institute of Science &Technology), ST microelectronics
Composition of the research group	1 Full Professors 1 Associated Professors 1 Assistant Professors 4 PhD Students
Name of the research directors	Prof. Tullio Tolio

Contacts

For questions about scholarship/support phd-dmec@polimi.it

Additional support - Financial aid per PhD student per year (gross amount)	
Housing - Foreign Students	
Housing - Out-of-town residents (more than 80Km out of Milano)	

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Scholarship Increase for a period abroad		
Amount monthly	750.0 €	
By number of months	6	

Additional information: educational activity, teaching assistantship, computer availability, desk availability, any other information

Financial aid is available for all PhD candidates (purchase of study books and materials, funding for participation in courses, summer schools, workshops and conferences) for a total amount of euro 6.114,50. Our candidates are strongly encouraged to spend a research period abroad, joining high-level research groups in the specific PhD research topic, selected in agreement with the Supervisor. An increase in the scholarship will be applied for periods up to 6 months (approx. 750 euro/month- net amount). Teaching assistantship: availability of funding in recognition of supporting teaching activities by the PhD candidate. There are various forms of financial aid for activities of support to theteaching practice. The PhD student is encouraged to take part in these activities, within the limits allowed by the regulations.