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国 际 高 等 教 育

上海交通大学密西根学院的宗旨和愿景

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上海交通大学密西根学院（the University of Michigan-Shanghai Jiao Tong University Joint Institute，以下简称密西根学院）是一所独立学院，提供机械工程和电子与计算机工程专业的本科和研究生教育。学院成立于2005年，2006年起开始招生。学院十分重视研究。尽管由于中国教育部的政策限制，学院授予的是上海交通大学的文凭，但它是一个独立、特殊的办学实体。学院的独特性在于，其院长直接向学院理事会而非向上海交通大学或密西根大学的校领导负责。理事会有权决策所有重要事项（参见本期有关学院治理的文章）。但在一些非学术性的内部管理事务上，学院的运作方式和上海交通大学的其它学院是一样的。

密西根学院的学生是中国学生中的精英，学生要通过层层的严格选拔才能进入学院学习。其本科生课程源自美国密西根大学。学生必须达到美国主要研究型大学的要求才能毕业。学院采用全英语授课。

学院有自己的师资队伍，教师独立于上海交通大学机械与动力工程学院和电子信息与电气工程学院的现有师资队伍。这些教师不由美国密西根大学的任命。学院的终身教职评定系统和美国密西根大学类似，只有在教学、研究和服务各方面都出类拔萃者才能在学院获得终身教职。

学院四年的本科教育要求学生完成128个学分的学习。学院的学制为一学期15周。70%的学生在学院完成全部学业；另外30%的学生将参与上海交通大学和美国密西根大学的双学位项目，他们必须在这两所大学分别完成一个专业的学习才能获得双学位。此外，每年约30~40名学生在学院的课堂里参加学院的暑假项目。

密西根学院的毕业生已经在世界一流的研究生院继续深造，也有学生在跨国公司里成功就业。学生的双语能力、对美国文化和沟通方式的精熟程度以及他们的课程学习经历，即美国密西根大学通过美国工程认证协会审核的课程，都使他们受到大学和雇主的青睐。

密西根学院成立的目的和过程

密西根学院是美国密西根大学和上海交通大学之间合作的结晶。这两所大学在很多方面都有共同点，两校之前的合作为学院的诞生奠定了基础。

两校合作的联系

两校在一些大学特征上实力相当，这对于两校的有效合作非常重要。首先，两校都是大型综合性研究型大学。第二，尽管美国公立大学、私立大学的概念不适用于中国的大学系统，但一开始上海交通大学就希望和一所美国的公立大学合作，因为上海交通大学相信与这样的大学有相同的愿景，两者对于政府资助的理解更容易取得一致。第三，两所大学都是各自国家的知名精英大学。最后，两所大学的工学教育都久负盛名。美国

密西根大学一直是美国工科高校的翘楚。上海交通大学的机械工程专业多年名列中国第一，该校其它工程专业也位居中国前列。

同时，上海交通大学希望向其合作高校学习，更好地向美式研究型大学发展。从这个角度来看，美国密西根大学能为上海交通大学发展其研究实力提供经验借鉴。

两校合作的历史

两校之间具有重大意义的合作可以追溯到2000年。当时，合作的目的是利用美国密西根大学的经验及其师资力量促进上海交通大学机械工程学院的发展。上海交通大学的教师、学院领导和行政人员到美国访问学习。美国密西根大学的教师随后也应邀来上海教课。经过选拔，上海交通大学组织了一批本科生成立了试点班，并尝试美国密西根大学的课程教学。其后的合作和两校之后的互动都为学院的建立铺垫了信任和理解的基础。

双方都有若干得力干将积极奔走于此，这对于学院的发展十分重要。在许多为此付出大量精力的人中，对于双方关系发展有决定意义的人有三个，分别是马德秀女士、林忠钦先生和倪军先生。马德秀女士现任上海交通大学党委书记。林忠钦先生在合作之初任上海交通大学机械工程学院院长，现任上海交通大学副校长。他们两位促成了学院在上海交通大学的发展。倪军先生是学院的现任院长，曾在上海交通大学获得本科学位，现任教于美国密西根学院，两校领导都对他十分熟识。倪院长自2000年起就致力于两校的合作。这些领导的积极推动是学院创立和发展的主要因素。

伴随机械工程试点项目的成功，两所大学就学院的理念进行了沟通，之后又商讨了学院的办学目标及其可能为两校带来的利益。2005年6月，学院落成仪式在上海举行，到场的除了两校的主要领导，还有许多中国中央政府和上海市政府的代表。2006年2月，教育部也下达了批文。2006年4月，学院面向社会招生；当年9月，第一批学生入学，共196人，这些年轻人勇敢尝试了密西根学院这样一个崭新的教育理念。

密西根学院的办学目标

学院必须追求各方面的卓越，这是它的愿景。理事会常常在理事会会议上重申：

第一，学院要成为一所世界一流的工程研究和教育机构。这一目标要求学院在学生、教师、设施和自我期许等各方面都追求卓越。学院选拔的学生是上海交通大学最优秀学生中的一部分，学生的平均水平超过上海交通大学工程专业的学生。教师的招聘标准与美国主要研究型大学相一致（参见本期关于学院教师管理的文章）。不论是本科生培养，还是研究生培养或前沿研究都一样重要，一样得到重视。实验室将按照国际标准建造。

第二，学院要把学生培养成为未来的领袖。学院使用的是美国密西根大学经过美国工程认证协会审核的课程体系，将一些专业技能融入课堂，例如，写作和口头沟通能力、创造力、解决问题的能力、团队合作能力、领导力和道德。其目的是为学生未来的职业发展作好准备，培养学生的综合素质，并非仅仅是技术专业训练。这种教育整体观与以解题和考试为主的中国教育体系还是有所差别的。

第三，学院的发展应与美国前20名的研究型大学不相伯仲。学院将自身的发展定位于《美国新闻与世界报道》大学排名中前20名的大学，在教师聘用的要求中，以及对研究、教学、社会服务、科研发展以及课程设

置等相关决策文件中都能反映这一点。

第四，在中国高等教育体系中尝试运用美国的学术体制。美国密西根大学和上海交通大学的一个很大的不同之处在于学生能力发展。进入上海交通大学的本科生，其学术能力一般都高于美国密西根大学的学生，但是两校毕业生的学术能力，至少在学术表现上，美国体制可能更胜一筹。通过四年完整的美式教育，学院希望自己的学生能够在学术水平上高于上海交通大学的其他学生。中国和美国的研究生教育体制有很大差别，美国在研究生培养上至今仍被视为世界顶尖。学院正试图将美国模式中独特的部分引入中国。

第五，学院应努力成为学生国际交流中心。自学院建立之初起，它就是一个国际化的学院。这不仅是因为学院是两校的齐心之作，还因为学生、教师和行政人员是在中国的教育机构中以美国的教育管理模式学习工作。除了两校之间大规模的学生交流活动，学院还希望能够创造大量的国际合作机会。学院计划与欧美顶尖大学建立学生交换和联合培养项目。

密西根学院作为一个国际合作结晶的独特之处

学院作为一个国际合作的结晶，其独特之处主要表现在以下几点：首先，学院提供综合的本科和研究生教育，同时也注重研究。第二，学生录取工作都是严格按照上海交通大学的入学标准选拔而来。学生必须达到学校的入学标准才具备进入学院学习的资格。工程教育领域的其它国际合作项目并没有这么严格的录取标准。第三，无论是美国密西根大学还是上海交通大学都没有营利动机。美国密西根大学不提供办学资金，他们也不接受任何资金作为报偿。上海交通大学则为学院的重要发展提供经费，但同时在稳定运行状态下保持学院财政独立。第四，教师是按照美国顶尖大学标准招募的长期雇员。第五，学院向由两校代表共同组成的理事会负责。学院在所有学术事务、教师选拔和主要决策上与美国密西根大学保持密切联系。

组织结构

在组织结构上，密西根学院的理事会由两所合作大学分别派五名高层领导组成，该理事会是正式管理学院的机构。理事会有权决策学院所有的战略规划和重大事项。他们对于教师的聘用和晋升有最终的决定权。学院院长倪军教授现任美国密西根大学教授，他由理事会任命，并对理事会负责。院长不对两所大学的主要学术领导负责，这使得密西根学院成为一个独立的学术机构。院长对于学院管理团队有任命权。学校有学术委员会为顾问团队，该学术委员会由两所大学各派三位专家领导组成。学术委员会每两周举行一次电话会议。

两校合作各自的目标

美国密西根大学的目标包括：第一，建立一个高质量的学院。在这里美国密西根大学的工科学生可以和中国学生互相学习语言、学习相同的课程。这是学院创建之初美国密西根大学提出的主要目标。这个目标已经通过学院的暑假项目实现了，每年夏天美国的学生以及越来越多来自其它美国大学的学生会来学院学习。第二，努力发展其工科学生国际化。一般来说，学院有 200 名学生在美国密西根大学攻读双学位，大三、大四年级各有 100 人。这些学生成绩优异，他们的平均绩点为 3.8~4.0（美国密西根大学自己

的工科学生的平均绩点为 3.2~4.0）。这个项目会带来两个主要的附加作用。首先，这些优秀学生大量涌入美国密西根大学的研究生项目学习。此外，他们也会为在美国密西根大学学习而支付额外的学费，每生每年要缴纳 3.5 万美元以上。第三，提升全球声誉。全球声誉——中国被全世界公认为快速发展的经济和技术引擎，美国密西根大学希望通过这项合作提升声誉。在中国，密西根学院也因其学术卓越而备受关注。因此，美国密西根大学在项目发展过程中树立了自己的品牌声誉。第四，发展研究合作。工学研究正在中国急剧兴起，许多跨国公司在中国建立了大型研究中心。一部分起初出现在美国的学术研究转向海外，而其中，中国将成为主要的受益国，推动技术发展，并建立一个相对应的大学体制以发展创新研究能力。学院的建立也意味着美国密西根大学开始与中国最好的大学开始合作，并在学院的师资队伍中为日后的研究合作埋下了种子。目前，美国密西根大学和上海交通大学资助了一个 500 万美元的合作研究项目，以发展两校在清洁能源和生物医药技术方面的合作。

上海交通大学的目标则包括：第一，提升研究声誉以及技术发展的学术驱动力。研究声誉和技术发展的学术驱动力——多年以来，中国都在努力提升学术研究的影响，以建设若干所有国际影响力的知名大学。其动机是促进经济转型：从制造业为主和劳动力密集型为主的经济，转向创新型和创业型经济。教育界领导和政府领导对于过去资金投入成效较为失望。在这样的环境下，密西根学院的核心使命就是研究，要求教师研究水平和成果能与美国排名前 20 的大学相当。第二，成为学习美国研究型大学办学模式的典型。中国发展国际知名研究型大学的挑战之一源于政策制定者缺乏相关经验。几乎所有的政策制定者都缺乏创建一流研究型大学的知识储备（当然，其中许多人也拥有一些基本知识）。学院将美国高等教育中有效的办学理念引入了上海交通大学，为教育改革提供了实验平台。这也是为什么要强调学院自治，这是学院发展的基石。第三，承担教育体制改革中的中介作用。中国的工科学校都非常庞大。例如，上海交通大学的电气工程学院有约 500 名教师和 7500 名学生；机械工程学院约有 300 名教授。这种规模限制了其体制改革，即使投入再多的资源也无济于事。学院对研究型大学的模式谙熟于心，能从一开始就发展课程设置、研究生教育、教师管理和研究管理。随着学院的壮大，它必将影响并带动大学其他学院的管理改革。它将带动校内其他学院的变革发展，并提供可参考的有效举措。仅仅几年，密西根学院在上海交通大学的影响力就显现出来，学校领导们乐见其成。

里程碑和现状

学生与学位教育项目

在学生和学位教育项目方面，密西根学院提供机械工程和电子与计算机工程的本科、硕士和博士学位教育，师资充裕。学院每年招收 250~300 名本科新生。学院最早的两个班级毕业于 2010 年和 2011 年，他们进入研究生阶段继续深造的比例很高。学院校友的首选是进入研究生院学习，其中很大比例的学生已被美国顶尖大学录取。

学院的双学位项目为学生提供了在两所大学的两个不同学科学习并获得双学位的机会。学生在密西根学院学习 2.5 年后，可转入美国密西根大学学习两年，分别从两校获得文凭。每年约有 100 名学生参与该项目，

每年在美国密西根大学学习的学生大约为 200 人。两校老师在指导学生方面保持密切合作。学院的暑假项目从美国密西根大学招收学生。想在夏季学期与密西根学院学生共同学习工科课程的学生可以申请。暑假项目是学院的一个重要学期。每年约有 30~40 名美国学生参与该项目。这些美国学生也要进修汉语和中国文化课程。学院正努力扩大该项目，以期接收来自其它大学的学生。

学院的学生可以选择本硕连读项目，该项目是由上海交通大学和美国密西根大学联合设立。项目要求学生在学院拿到本科学位后在美国密西根大学完成为期一年的研究生学习。若在密西根学院学习 6 个学分以上的研究生课程，则可以转换成美国密西根大学硕士学位的学分。在录取过程中竞争相当激烈，严格遵循美国密西根大学的研究生招生程序。这个项目很受学生的欢迎，并为美国密西根大学的研究生教育输送了一批高品质的学生，学生一般为自费，但第一年一般不收取学费。

目前，学院拥有约 50 名研究生，其中前两届学生各 25 名。学院也希望尽快扩充研究生数量以满足教师们越来越多的研究需求，但是出于对人才培养质量的重视以及中国教育部的研究生名额和录取程序限制，学生增长率有限。

教师

在教师方面，学院现有 20 位教师，他们分布在机械工程和电子与计算机工程的各个领域。学院的长期发展目标是 45 位教师。除此以外，学院还有 8 位讲师教授工学、英语以及人文社科方面的课程。这样，就能保证学院本科课程和研究生课程的教学。

行政人员

学院约有 25 名行政工作人员。在学院的初始发展阶段，行政人员与教师的比例较大，这是因为在教师数量较少的情况下，学院必须保证学院各项工作的正常开展，如工资发放、财务、人力资源、招生、学术管理、学生事务、学生咨询、研究生项目管理、研究办公室、公共沟通和宣传材料、国际项目管理以及秘书工作等。另外，学院还聘用了一位执行主任，其工作职责包括对职员进行管理。

上海交通大学密西根学院的治理、资源和管理

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上海交通大学密西根学院（the University of Michigan-Shanghai Jiao Tong University Joint Institute，以下简称密西根学院）是有两所高校共同开发、运作和监督的国际合作机构。它建立于 2006 年，其使命是成为一所能与美国主要研究型大学比肩的研究机构。美国密西根大学与上海交通大学对密西根学院给予了很多办学自主权。学院正在引进一个中国独有的院校治理模式。尽管是一个独立学院，它仍坐落于上海交通大学的校园内并为学生授予上海交通大学颁发的文凭。因此，它又会受到上海交通大学已有的程式、体制和组织的一定约束。本文描述了密西根学院的治理模式、经费来源和学院作为上海交通大学下属单位的管理和运作。

治理模式

密西根学院的治理分四个层次：理事会、院长领导的内部管理团队、学术委员会和教师。以下将分别讨论。

密西根学院在中国作为学术机构的一个不寻常的特点是：中国大学及其学院、系和行政单位都会有一位党委书记，密西根学院没有这一类的管理人员。这反映了学院的独立性和打破传统的创新性，以及美国密西根大学和上海交通大学平等的伙伴关系。

理事会

密西根学院的最高管理机构是理事会，对学院的重大事项有决策权。理事会由来自密西根大学和上海交通大学各五名的高级领导组成。其中，包括了美国密西根大学的 Mary Sue Coleman 校长、Philip Hanlon 副校长、工程学院的 David Munson 院长、医学院的 James Woolliscroft 院长以及人文学院的 Terrence McDonald 院长，和上海交通大学的马德秀书记、林忠钦副校长、黄震副校长、张文军副校长以及医学院陈国强院长。

理事会每年开两次会，其中一次是视频会议。会议的列席率一般都极好。会议的主要目的是回顾学院重要的发展进程、制定下一阶段发展目标，对重要的学术、预算和设施问题达成一致，对终身教职和晋升事项投票，并对院长的工作进行指导。会议的议程在院长和学术委员会的建议下制定。每次会议上，院长会陈述密西根学院的现状以及上次会议以来取得的重要发展。会议会对需要理事会决策的事项预留讨论时间。理事会在会上可能讨论的事项有：预算、招生、研究空间、办公室、教学、实验室设备、教师招聘以及学术合作项目等。

理事们除了通过理事会会议就重要问题和决策进行直接讨论外，理事会在学院治理上的参与是贯穿全年的。院长会频繁地单独与美国密西根大学和上海交通大学的理事会成员沟通和见面，商讨最重要的问题以及需要某位理事会成员适当采取行动的问题。密西根学院在两所大学中都有较高的知名度和地位，通过学院理事会的常规性互动，这些

讨论以及学院的整体状况为两所高校的理事会成员所熟知。

领导团队

在密西根学院的领导团队中，院长由理事会任命，并向理事会负责。院长肩负学院的发展和管理大任，如教师招聘和组织、学生事务、学术项目、预算以及设备等事宜。由于密西根学院是一个独立机构，密西根学院的院长只向理事会负责而不必顾及这两所合作大学的学术副校长。

从 2006 年建立以来，密西根学院的院长一直由倪军教授担任。倪院长同时也是美国密西根大学的教授，他从 1989 年起就任教于该校。他把自己的时间分配给两所大学，用电子通讯工具与双方学校保持联络。由于倪院长在美国密西根大学和上海交通大学两校之间频繁来往，让他得以和所有理事会成员保持经常的联系。倪院长在 2011 年 2 月再次被理事会任命为密西根学院的院长，这届任期到 2014 年 5 月结束。在密西根学院，院长有组建管理团队的灵活性。

执行院长由院长提名，由理事会任命。执行院长的职责是在院长离开期间接手密西根学院的实地管理。此外，其角色还包括监督学术事务，如教师终身教职评定和晋升、教师招聘、年度考核、预算管理，以及学术项目的发展等。目前，Robert Parker 教授担任密西根学院的执行院长。

主管教学和科研的副院长是学院管理团队的另外两位重要人物，他们由院长任命。主管教学副院长目前由黄佩森教授担任，他负责管理有关教学、课程发展和研究生教育的事务。他是密西根学院与上海交通大学就学术事务进行沟通的联络人，这个功能是真实存在的，因为密西根学院是上海交通大学的下属单位，密西根学院的学生获得的是上海交通大学的学位。主管教学副院长与密西根学院的本科生委员会、研究生委员会以及密西根学院的学术办公室（注册办公室）有密切的工作联系。主管研究副院长目前由赵万生教授担任，他负责所有研究发展事务的管理，包括空间和设备、研究政策协调、密西根学院研究人员的管理、合作团队的形成，还包括密西根学院与上海交通大学其他单位教师合作的有关事务。

密西根学院的执行主任管理所有教职员工的工作分配、教职员工招聘和雇用政策等，目前由 Pam Byrnes 女士担任。职员分别被分成三组：教务办公室、资源和财务办公室以及对外交流与合作办公室。

学术委员会

学术委员会是密西根学院院长的顾问团。2008 年美国密西根大学和上海交通大学的协议中指出，“在联合学院发展初期，教师队伍还不够组成一个教师执行委员会的时候，由密西根学院资深教师和两所合作大学的教师指导帮助学院院长管理学术事务”。

密西根学院的院长将通过一个小组代表密西根学院和两所高校的高级教师对学术事务进行指导。除了提供咨询建议以外，学术委员会对于做好密西根学院与美国密西根大学政策制定者之间的联络和交流工作至关重要。本届学术委员会成员包括美国密西根大学工程学院管理本科教学的 James Holloway 副院长、工程学院国际项目顾问 Volker Sick 教授以及人文学院 James Penner-Hahn 副院长，和密西根学院的执行院长 Robert Parker 教授、黄佩森副院长和赵万生副院长。

学术委员会每两周进行一次电话会议。日程允许的话，每年委员的成员会私下见几

次面。学术委员会讨论学院的各种决策及学院面临的挑战和机遇；有决策并保持与美国密西根大学保持沟通的双重作用。委员会十分重视课程发展，特别是与美国密西根大学合作的双学位项目和暑期项目，它们都要经过细致的协商。与教师任命、晋升和终身教职有关的主要政策和程序也是学术委员会合作制定的。学术委员会对于所有密西根学院教师的招聘进行评审和建议。目前，学术委员会在终身教职的决策上有了一个正式的角色，即委员会的评估需要和教师、院长的评估一起提交给理事会做为最终决定的材料。从这方面看，学术委员会的功能和美国大学校级职务晋升和终身教职委员会的职责相似。学术委员会就密西根学院的未来发展进行战略规划讨论，帮助院长制定理事会会议议程计划等；在扩展密西根学院的国际学术合作方面提供建议，包括与其他美国大学建立新的项目、新的双学位项目形式、与美国密西根大学合作的本硕连读项目，以及和美国密西根大学的其他学院建立此类项目。

正如密西根学院治理结构设计之初就预料到的，学术委员会只是一个过渡性的机构，到学院的教师队伍完整、能够在重要问题上代表教师意见、为院长提供建议时，就是该委员会退出历史舞台的时候。那时，由密西根学院教师选举出来的执行委员会将取代学术委员会，原学术委员会将解散或进行功能的重新定位。变化已经开始发生：随着密西根学院教师队伍的发展壮大，教师们已经能够通过类似于美国大学传统的内部治理讨论会议表达自己的意见。其他治理结构较为成熟的委员会也在密西根学院建立起来，同时也影响了其与学术委员在决策制定中的平衡关系。

院系治理与委员会结构

在院系结构治理方面，密西根学院目前还没有设置系一级的结构将机械工程和电子与计算机工程两个专业区分开来。学院规模相对较小，现有 20 名教师，未来目标是 45 名，因此也允许采用这种形式。可能的话，这种状态将会在密西根学院的发展中得到保持，重要原因有以下几点：一是要尽可能促进教师合作和共同治理，让教师把自己视为密西根学院而不是学院内部单位的一部分；二是要促进跨学科研究合作，鼓励利用不同学科优势开拓新领域的团队形成；三是这种安排能让资源配置实现最小冗余。

密西根学院现有以下几个委员会：教师搜索委员会、研究生委员会、本科生委员会、空间和设备委员会、学科委员会以及荣誉和奖励委员会。这些委员会是除了教师会议上的公开对话之外学院教师治理的主要工具。这些委员会由教师组成，其中一些合适的、非终身教职讲师为这些委员会做出了重要贡献。每个委员会的成员由院长和副院长任命。这些委员会独立于学术委员会，尽管它们的提案会提交给学术委员会讨论。

正如上文提到的关于学术委员会的部分，密西根学院最终将形成一个由教师选举出来的执行委员会，这将会给教师带来更大的决策发言权。

教师治理的一个关键方面是终身教职评定和晋升决策。申请终身教职或者职称晋升的教师向某个相关委员会提供其评审所需的必要信息。该委员会由教师组成，由院长任命；同时也对搜集该申请者综合资料起到重要作用，这些资料包括外部评审意见、内部教学评估，以及候选人提交的研究资料。

所有拥有相应职称头衔的教师会见面并

公开商讨资料的内容，随后进行封闭式的投票，最后将投票结果放进资料袋中。所有材料会被传递给下一轮。所有的非终身教职教师都要经历一个综合的“第三年评审”，评审过程中拥有相应职称头衔的教师会参与每个候选人的职称评审和投票。

学术事务管理

尽管密西根学院在学术发展方面名义上是一个独立自治的机构，但是在上海交通大学学生的学位授予权属于学校，且密西根学院的教师受聘于上海交通大学，因此，学院有一些决策和政策必须与上海交通大学相协调。上海交通大学建立密西根学院的目的之一是学习并尽可能采用美国学术体制的理念，而学术问题是连接这些理念的桥梁。

在本科生课程和研究生毕业要求的问题上，密西根学院几乎拥有完全的自主权。作为上海交通大学的下属单位，密西根学院只面临两个重要问题须与学校沟通。其一，学生除了完成美国密西根大学课程体系中的 128 个学分，还必须完成 22 个中国教育部规定的学分。教育部的指定课程包括政治、军训和体育课等。第二个课程问题是，密西根学院得到上海交通大学的批准，可以不遵守学校和其他中国大学的毕业论文要求。不同于个人的项目和论文，密西根学院的毕业标准要求学生分组后以毕业设计课程的方式接受导师的指导，最终拿出一份合作论文和一个实体模型。

在教师晋升事务上，上海交通大学自动认可密西根学院招聘的助理教授、副教授和教授。密西根学院的终身教职评审和晋升评审程序完全由学院自己决定，不涉及学院以外的上海交通大学的教师。然而，学院必须向上海交通大学保证评审程序的严格性和适当性。由于相关的职称晋升还未在学院发生，所以很难说学院和大学之间在这些方面是否真的存在矛盾。一旦学院和大学就教师晋升发生不同意见如何解决等问题都还未发生。但是，由于密西根学院和上海交通大学对于评价研究成就和影响力有不同的偏好，产生不同意见的可能性是存在的。密西根学院采用的是美国研究型大学的一般做法，非常重视外部评审意见。

密西根学院的学生也是上海交通大学的学生。在学术事务上， 学院的政策与上海交通大学的政策不同时，以密西根学院的为准。在其他事务上，以上海交通大学的政策为准。在非课程方面，密西根学院和上海交通大学的一大不同是“诚信守则”，它被密西根学院用于处理学术不端行为。在这方面，密西根学院的政策与上海交通大学的政策在预期结果和实施中有明显的不同。上海交通大学也已经开始仿效密西根学院的这类制度。

资源

关于办学经费问题，密西根学院的主要经费来源是本科生的学费。所有密西根学院本科生缴纳的学费都返回到密西根学院谨慎使用。目前密西根学院向中国学生每年收取三万人民币的学费，这个标准是其他上海交通大学学生的 5~6 倍。因此，其他上海交通大学的学院依靠中央行政拨款，而密西根学院则不能。

密西根学院发展之初，上海交通大学为密西根学院提供额外的补贴。等今后密西根学院走上正轨，教师规模达到 45 人、本科生人数达到 1600 名、研究生人数达到 200 名后，这笔津贴将取消。

美国密西根大学不为密西根学院提供任何经费，它也不从中国或密西根学院收取任

何费用。但是它对密西根学院的贡献远不止声誉的价值，它通过多种方式支持密西根学院的行政管理，如允许倪军教授出任院长，派代表参加理事会，派代表加入学术委员会管理，为密西根学院的本科生课程提供模板，就联合学术项目开展重要合作等。

密西根学院对于研究项目相关的间接成本付出不会有任何财政返款。教师获得的研究经费，扣除交给学校研究办公室的间接成本后，全部用于研究。这类对间接成本的处理是一个令人关心的问题，因为对于用于有关研究项目的间接成本，学院不能收到任何财政返款，例如学院使用上海交通大学的研究空间所需的费用等。

密西根学院能自由接受公司或个人的捐赠,，并且已经收到了部分捐赠，但是相对学院的办学经费模式而言仍然微不足道。

在学院的办公楼和设备方面，密西根学院坐落于上海交通大学主校区的一幢办公楼中。这幢办公楼与该校的法学院共用。对于教师办公和一些实验室来说很适用，但是这幢楼缺乏一些研究实验室的必要设备。目前密西根学院在校园中拥有零星的几个实验场所，还要向学校支付相关费用。这种分散的安排对于研究合作、教师招聘、招生、通过合作提升教师的凝聚力会产生不利的影响。空间问题的长远解决方案仍需要与上海交通大学进行更积极的讨论。

其他资源方面，密西根学院依赖于上海交通大学。这些资源不仅仅只是经费或基础设施，还包括学生宿舍（密西根学院和其他上海交通大学的学生支付同样的住宿费）、图书馆、体育设施、餐厅、研究经费管理、招生帮助、教师和职工的雇用事务（如发工资、税金、签证等）、采购、学费收取等等方面的资源。密西根学院和上海交通大学的其他学术单位一样免费使用这些资源。

与上海交通大学的管理协调

尽管密西根学院在学术事务的管理、师资队伍的招聘和组织、办学经费的使用上是一个独立机构，但它实际上仍是上海交通大学大环境中的一个单位，很像该大学其他学院的运作。因此，密西根学院继承了上海交通大学制定的许多政策，涉及财政、人力资源、采购、差旅等方面。这一安排对于学院有很多益处，但在很多方面学院也受其限制。

密西根学院获得的益处包括现成的教室、实验室、图书馆、宿舍、研究支持服务、工资发放和税务管理、人力资源功能、招生机制、采购程序、学生服务、注册服务以及一个机构日常所需的所有附属需求。要分别建立这样的服务和设施需要昂贵的经费和漫长的时间。能够获得这些，让密西根学院能从相对小的投入起步并以很快的速度发展，如美国密西根大学和上海交通大学签订合约之后一年内第一批学生就入学了。

然而，密西根学院独特的办学使命和学术、教职工事务上不同的运作管理也会给学院造成问题。学院不同的教师晋升体制和对教师的要求就是其中主要的不同点之一。密西根学院采用的是美式终身教职系统，含助理教授、副教授和教授三种职称头衔。资历较浅的教师应该从到校工作开始就努力发展自己的独立研究能力，包括指导博士生等。内部评估、外部评审、教师投票、理事会决策这一系列程序保证了候选人的各归其位。但是，密西根学院的教师也是上海交通大学的教师。因此，上海交通大学的相关政策有时也会与密西根学院的美式体制起冲突。这种问题常常需要大学的高级领导的介入才能解决。

其他需要解决的问题包括：由于学院的学期长度和时间与上海交通大学的不同，因此学生注册、成绩单、毕业等方面的工作需要协调；学院对于研究生教育的质量标准采用了美国标准，与上海交通大学的一些规定不一样；学院的主要办学经费来源是学生的学费，虽然有其自主的一面，但有时也会受到学校对于其他来源经费使用规定的限制；学院的教师薪酬制度也采用了美国大学 9 个月的工资模式，并限定教师从科研经费中获取的年收入不能超过 3 个月的薪酬，与上海交通大学工科教师的薪酬体制不同。

这些问题都是可以得到解决的，但是问题还是经常出现，因为许多上海交通大学的支持服务部门的管理人员把密西根学院和该校其他学院一视同仁，他们不知道密西根学院的不同之处或者他们没有权力实施密西根学院理事会的决定，尽管这些决定中也含有上海交通大学高层领导的意见。

结语

密西根学院的治理结构适应了其独特的环境，即理事会下达命令并将往下传递，这模仿了一所独立大学的做法。但同时，学院也是上海交通大学的一个下属单位。最重要的事，学院也被授予例如美国研究型大学模式下的办学自主权。

这对于密西根学院达成预期目标非常重要。事实上，密西根学院成立的宗旨之一就是作为上海交通大学制度改革的实验平台，自主办学是密西根学院最为突出的特点之一。如果想要模仿密西根学院的办学模式，人们就必须清楚地认识到拥有一个独立理事会的重要性和价值，即这个理事会对重要事务有决策权，这个理事会也制订了密西根学院的全盘发展战略。

上海交通大学密西根学院的教育项目

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上海交通大学密西根学院（the University of Michigan-Shanghai Jiao Tong University Joint Institute，以下简称密西根学院）的使命是打造一所在工程教育和工程研究方面享有盛誉的学院。学院正在上海交通大学的校园里独立创新、开拓前进。学院的课程体系以美国密西根大学为蓝本，为学生提供全英语的教学环境，被视为中国大学和政府携手推进的一所独一无二的学院。

本科教育

密西根学院的本科教育始于 2006 年秋，第一批学生约 200 人。五年后的今天，学院的学生规模已经增长到 1000 人，在工程教育上也声名鹊起，具有竞争力，国际化程度高，吸引了中国一流的生源。

学院本科教育的目标包括：为学生提供综合的工程教育，为学生在所选领域中学习研究奠定坚实的基础；着重培养学生解决问题、创新设计和批判思考的能力；提升学生的团队精神、沟通技巧、专业素养、道德和环保意识；课内外相结合培养学生的终身学习能力和学术研究的能力；为学生拓宽知识面提供充足的技术专业课程和一般选修课程。

课程设置

密西根学院提供两个专业的本科学士学位教育：机械工程和电子与计算机工程。对这两个专业的教育，学院提供两个与美国密西根大学联合培养的国际项目，分别是双学位项目和本硕连读项目。下文将详述机械工程和电子与计算机工程教育的内容。有关双学位项目和本硕连读项目的内容请参见本文另一部分的内容。

密西根学院的电子与计算机工程和机械工程的专业教育分别以美国密西根大学的电子与计算机工程系和机械工程系为蓝本。学院的全部课程都用英语授课。包括工程、科学和人文社科课程在内的大部分课程都与美国密西根学院的相关课程等同，因而可以实现学分的无障碍转换。

密西根学院的电子与计算机工程专业是跨学科专业，受美国密西根大学的电子与计算机工程系大力支持，完全覆盖了其所有核心要求。该专业既强调硬件技术也强调软件

技术，重视强调学生应用课堂上所学的知识而创造性地解决现实问题的能力。课程的灵活性使学生能专注于该学科领域中不同分支科目。在整个学习过程中，学生可以使用现代的实验室设备和计算机系统，置身于所学领域的最新技术发展的环境中。

学院机械工程专业的背后有美国密西根大学机械工程系的支持，为学生提供该专业核心技术领域的精英教育，这些技术领域包括：热流科学、固体力学和材料、动力学和控制以及设计和制造。通过设计、制造和机械工程实验室的课程序列，该专业能让学生沉浸在团队合作、技术通信、设计创新以及解决问题的环境中。此外，学生能够选修一系列的技术类专业课程，从而能将自己所学的机械工程教育与职业发展目标达成最佳匹配。

学院两个专业各包含 150 个学分，课程包含公共课、核心课程、专业课、人文社会科学课程、技术类选修课以及通选课等类别。150 个学分中，128 个学分是专业要求；另外 22 个学分则是教育部的统一要求，即学生必须研修规定的人文社科课程、英语课和体育课。

密西根学院采用了多种措施以保障教学质量。例如，数学课和物理课被分成“普通”和“荣誉”两个系列，以适应不同学习程度的学生。有些课程会安排多位教师共同教学，如一位工学教师和一位技术通信专业的教师搭配在一起。一些课程还会让不同的教师分段教学，班级规模也更小。

学院课程设计的特色可以总结为以下几点：在各种课程中引入开放式设计问题，以培养学生解决问题的创新能力；实施以团队为基础的课程计划，以培养学生的团队合作精神和项目管理能力；在实验课和设计课中将工学和技术通信的内容结合起来，以提升学生的沟通技巧；在贴近现实的工程环境中创造实践机会，以帮助学生发展成为具有实践能力的未来工程师；与跨国公司合作，为学生提供与工程师直接互动的机会，以提升学生解决现实世界中工程问题的能力。

师资队伍

在师资方面，密西根学院的本科课程由美国密西根大学和上海交通大学优秀的教师团队教授。目前共有 92 位教师为学院的本科生上课，其中 33 人来自美国密西根大学，23 人来自上海交通大学，4 人是来自其它海外学校的访问教授，另外 32 人是密西根学院自己聘用的教师。这些来自美国密西根大学的教师为该学院的本科生教育做出了巨大贡献，他们中大部分在学院的夏季学期教授核心专业课程。他们带来了先进的教学方法，在学院创造出美国密西根大学的教育环境，让学院的学生受益非浅。学院也与上海交通大学各个学院的教师保持着良好的合作关系，这些教师为学院每年 3 学期的教育计划提供所需课程。

学院在师资聘用上投入了大量的心血，并成功引进了多个国家的一流教师。教师聘用标准和美国密西根大学的一样。所有的教师都持有国际著名大学的最高学位，他们也具有被美国和其他国家的顶尖大学录用的实力。

所有密西根学院的教师都要按规定为本科生上课，包括 3 位获得国家“千人计划”的学者。除了课堂讲授以外，教师们都欢迎学生将课堂讨论延伸到他们的办公室，他们也常常参与指导学生的研究和设计项目。因此，学生有许多与杰出教师开展前沿研究的机会。

教务支持

学院的本科生教育工作由以下管理结构指导支持。首先，学术委员会，其成员来自密西根学院和美国密西根大学工学院的管理层，对学院的管理起着重要作用。所有与本科生教育有关的主要事务，如教师招聘、课程设计、国际项目发展和学生指导等，都会通过每两周一次的网络会议讨论和决定。再者，本科教育委员会，负责本科教育的课程设计、学术政策调整、课程教学以及日常管理。该委员为学院内部沟通以及和两所合作大学间的沟通打造了一个流畅、高效的平台，从而能保证为本科生提供最好的教育。第三，学院办公室，是学院最重要的办公室之一，为所有教师和学生提供学术相关的服务，并在与两所合作大学就学院事务细节的协调中扮演重要角色。第四，课程顾问，与学院办公室一起为学生四年的学习生活提供学术咨询服务；在一些特殊情况下，课程顾问也会处理学生学业上的问题。第五，学生事务办公室和学生辅导员，帮助学生做大学生活和职业生涯规划。第六，兼职学生导师，负责为学生提供有关学习和学习以外问题的支持和及时的帮助、指导和监督。

学院在学生导师、学生辅导员、课程顾问、院办工作人员以及学生和学生家长之间已经建立起有效的反馈和沟通渠道，从而保证学院有一个健康的学习和生活环境。

质量监管机制

学院精心设计并采用了评估工具，建立了一套课程和教师评估机制。学生的反馈信息会传达给任课老师和学院的管理层。评估结果对于教师的终身教职评审、晋升和奖励而言是重要的参考信息。

教学助理负责评分、领导实验和教授书本课程。教学助理的质量会直接影响课程质量。学院办公室和教学中心已经就教学助理的招聘和管理制订了严格的规定，包括招聘和面试程序、合同管理、职责分配、培训、指导和监督、评估以及报酬等。

教学中心是学院新建立的单位，其使命是为包括教学助理在内的教师提供支持，帮助他们发展教学质量。通过引进北美顶尖高校已有的最好做法，教学中心因地制宜地为学院设计了教学服务。教学中心的典型活动包括圆桌教学会议、教学助理培训论坛、教学观察、教学相关调研等。中心也与美国密西根大学的研究和教学中心以及上海交通大学的教学发展中心建立了密切联系。

特色课程

学院的课程以美国密西根学院的为蓝本。因此，与中国相似的专业教育相比有许多独特之处。这里以两门课作为案例显示其课程设计特点：工学导论课程和毕业设计课程。从中可以看出，学院的教学方法和中国工程专业课程的典型教学方法大相径庭。

工学导论课程专为新生设计，让学生形成对实践工程师的第一印象。课程强调解决现实问题、团队协作、沟通和创新。课程分几段，每一段都会按照工学教师的专长选择一个工程学的主题。该课程的一个特色在于技术通信的内容，这部分由一名技术通信领域的教师教授，并与工程学无缝结合。学生通过完成两个以团队为基础、开放式的设计项目，不仅能学到解决工程设计问题，还能学会写项目报告和怎样高效地做口头汇报。项目要求学生亲自动手，以诱发学生对工程学的兴趣，并使他们在未来的学习中更有目的和意义。

毕业设计课程则专为毕业班学生设计。

该课程以项目为基础，注重的技能和工学导论课程一样，例如解决现实问题、团队合作、沟通和创新思维等能力。一些由跨国公司提供并资助的实际项目中包含一些精心设计的开放式设计问题，学生通过这些问题能够学会系统地解决设计问题，学会应用各种课程中的工学知识和技能处理工程问题。学生需要提交一份完整的项目报告和一次正式的口头汇报。此外，学生还将面对许多专业问题，以及道德、创业精神、环境的可持续发展的问题等。

尽管工学导论课程和毕业设计课程有许多共同点，但他们之间也有区别。工学导论课程鼓励学生用直觉和常识解决设计问题。而毕业设计课程则要求学生用高等数学和工程学工具解决设计问题。每个学期，学院都会组织一个设计展会，在这其中，学习这两门课程的学生以及其他设计课程的学生都要做展台，陈列自己的作品，并与其他同学竞争设计奖项。

诚信守则

密西根学院的诚信守则是明显不同于其他中国教育机构的一点。它最初是受美国密西根大学诚信守则的启发，后来根据学院的实际情况做了调整，两者之间最大的不同在执行和惩罚。

维护、使用和发展诚信守则和相关制度的任务主要涉及两个机构。一个是诚信委员会，成员包括由大一到大四所有年级的本科生代表和两名学生辅导员。每届被任命的学生代表任期是一年，两名学生辅导员是固定成员。另一个是教师纪律委员会，由三名教师代表组成。

诚信委员会要处理违反诚信守则的报告和调查，并对被告是否有过失做出裁决。对于经诚信委员会裁决有过失的学生，教师纪律委员会要决定具体的惩罚措施。许多情况下，惩罚措施是标准化的（如降低课程分数、强制修读额外学分等），但是根据过失的严重程度也会有所调整。学生和教师如果不服裁决，都能申诉。诚信委员会的调查结果可以上诉到教师纪律委员会，再由教师纪律委员会要求诚信委员会重新裁决；教师纪律委员会的决定也能上诉到学术委员会。

学生调查显示，学院的绝大多数学生都对诚信守则感到骄傲，并给予完全支持。它被视为学院的一笔财富，也是学院在上海交通大学不同学院中彰显特色之处。近年来违反诚信守则的行为直线下降，并正在接近美国密西根大学的水平。引入诚信守则提升了学院的声誉，同时也教育了学生恪守学术诚信。

研究生教育

如果说本科生教育专注于通过课堂和实验发展学生的知识和技能，那么研究生教育则越来越重视发展学生独立研究的能力。在硕士学习阶段，学生仍必须进修多门课程；但在博士学习阶段，学生学习的中心是开展原创性的研究。

在研究生教育阶段，学生将在教授的指导下参与研究项目。一般来说，研究项目由校外的企业、基金会或政府机构资助。很多研究生在学习初期很难选择导师或研究方向，因此学院为每个研究生新生提供了一个研究生助教职位。如果学生承担了助教工作，那么他们就可以在秋季学期结束前拿定主意。这一政策帮助学生从以课程学习为主的本科生教育平稳过渡到以研究为导向的研究生教育。

课程设置

在学位课程方面，学院提供两个专业硕士和博士课程，这两个专业分别是机械工程和电子与计算机工程。

要获得硕士学位，学生必须修完工学、数学和科学研究生层次相关课程的 21 个学分以及技术通信专业方面的 3 个学分，并且其平均绩点不少于 3.1。此外，学生需要顺利通过硕士论文答辩。

在博士教育方面，对持有本科学位的新生和持有硕士学位的新生的毕业要求不同。前者需要修完工学、数学和科学相关研究生层次课程的 39 个学分以及技术通信专业方面的 3 个学分，平均绩点不低于 3.3。后者需要修完工学、数学和科学相关研究生层次课程的 18 个学分以及技术通信专业方面的 3 个学分，平均绩点不低于 3.3。除了课程要求外，所有的学生需要通过博士论文开题以及博士候选人资格考试，并成功通过博士论文答辩。

教学方面

在课程设置方面，学院以美国密西根大学机械工程系和电子与计算机工程系的课程为蓝本。所有的研究生课程由学院的教师用英语讲授。目前教师队伍已经充实到 20 人，组成不同的学科组。在机械工程领域，有设计和制造、动力学和振动、流体力学和热科学、固体力学、结构以及材料、机电一体化和控制的学科组。在电气工程和计算机科学领域，有计算机功能结构和工程、电磁学、光学，光电设备、通信和网络、信号处理的学科组。最后，数学和计算方法学科组为整个专业提供支持。

每个学科组要负责一到两门研究生核心课程的教学，这些课程是特定领域的入门课程。学科组也会在适当时机开设许多选修课，以支持学生的研究。

研究方面

在研究方面，学院的教师除了教学以外，还积极进行高端研究。在机械工程领域，研究方向包括生物医学技术、能源和电力系统、机电一体化和控制、热力学和流体力学、动力学和振动以及设计和制造等。在电子与计算机工程领域，研究方向包括通信网络、微波、控制、电动车、微米与纳米技术、光电、生物医学成像等方面。所有加盟学院的教师都有启动经费。

学院中相当数量的教师都争取到了中国研究主管部门的经费，如国家自然科学基金委员会的竞争性研究经费、青年基金、973 子项目、国家重点实验室经费、各类人才计划以及上海政府基金等。未来，学院教师的目标是申请更多的经费，如 973 和 863 项目、一些专业领域的国家重点研究项目以及国家自然科学基金委员会的重点项目。

一些教师还积极参与学院自己的“密西根学院研究合作项目”，这些项目为美国密西根学院与上海交通大学的研究者进行合作研究提供经费。

学院教师也积极寻找与工业界合作研究的机会。其中，许多公司是在中国十分知名的美国公司。学院的研究项目对这些公司很有吸引力，因为这些公司对学院的管理结构和发展目标非常认同，对学生的英语要求很高，并且对于学院整个商业和研究目标导向很熟悉。

学院在研究生的研究讨论班方面也一直在努力。无论是本科生还是研究生都缺少在众人面前讲述自己研究进展的经验，同时许多工学学生性格内向，害怕公共场合发言。然而，展示自己的研究思想和结果的能力是

学生应该在研究生教育阶段获得的最重要的能力之一。

终其一生，工程师都需要做无数的报告，这些报告会对其职业发展和晋升机会产生重要影响。无论是公共还是私立部门的雇主都对在专业技术上和语言表达上都很出色的工程师十分看重。事实上，具有创新创造力的人并不一定是最具原创思想的人，而是那些有能力用最激动人心的方式阐明自己思想和愿景的人。

因此，研究生的研究讨论班旨在实现以下目标：提高研究生的表达能力，使他们能更自信、更优雅地用英语演说；训练研究生在类似国内和国际会议的环境中介绍自己的工作；为学生在其学习生涯中就语言表达技巧提供系统的、建设性的反馈；让本科生能够有机会接触各种研究主题。学院没有把机械工程和电子与计算机工程专业分开，意味着学院的本科生能接触到跨学科的研究主题。

研究生助教体系

担任研究生助教所履行的职责有实质的教育意义。作为助教，研究生要学习沉着应对难题，回答本科生在基础学习过程中所遇到的问题，并用简单的语言讲清楚工学的基本概念。此外，助教也能锻炼其领导能力和演讲能力。因此，学院要求所有的研究生在研究生期间必须担任一个学期的助教职务。

国际项目

学院的国际项目包括学位项目和非学位项目。学位项目又分为双学位项目和本硕连读项目。非学位项目有与美国密西根大学、德国柏林科技大学合作的国际交流项目，分为寒假项目和暑假项目。这里将介绍这些项目的细节以及学院对国际项目的未来计划。

双学位项目

学院的双学位项目能为学生提供在两个不同专业学习两个本科课程的机会。其中，一个学位由美国密西根大学颁发，另一个由上海交通大学颁发。此外，学生能从学院获得表明他们完成本科教育的证书，证书上有两所大学的印章、理事会成员的名字以及院长的亲笔签名。

攻读双学位的学生前两年在学院学习，可选机械工程或电子与计算机工程专业。后两年将转到美国密西根大学学习，从工学院提供的 15 个专业中任选一个继续学习。当学生在美国学习规定的专业课程时，他们也需要完成学院本身要求的课程。此外，当学生完成在美国第一年以及全部学习计划后，需要分别返回密西根学院完成夏季学期的课程，这样才能达到学院 4 年学位课程的要求。

攻读双学位的学生如有意转到美国密西根大学继续相关专业学习，需在第二学年的秋季学期准备并提交申请。这些申请材料会在次年 1 月转到美国并供美国密西根大学的老师进行评估。录取标准包括学生在学院前三个学期的平均绩点、英语水平证明（托福、雅思成绩或密西根英语语言水平测试成绩）。美国密西根大学的每个系都有各自对平均绩点的要求。学生只有达到相关院系的要求后才能被录取。考虑到学生的多样性，美国密西根大学每年为攻读双学位的学生开放 100 个名额（各专业的名额也包含在内）。每年 11 月，录取信息会发给学生，这样学生就能据此安排学习计划并作出最后决定。需要注意的是，在美国密西根大学考虑学生转学资格时，学院的学生和其他申请学生之间是一视同仁的。不过，学院的学生在申请中被免除

了申请费用。

2011年学院双学位项目的招生人数为75人，占学生总数的 43.9%。双学位项目是学院最受欢迎的国际项目。许多学生因为这个项目而来密西根学院学习，其中一些学生还放弃了就读清华大学和北京大学的机会。

本硕连读项目

学院的本硕连读项目允许学生在五年内拿到本科和硕士学位。学生前四年在密西根学院学习，获得机械工程或电子与计算机工程的本科学位，接着转入美国密西根大学的相关专业完成一年的研究生学习，第五年底拿到硕士学位。这个项目时间短是因为有 6 个研究生层次课程的学分能按双倍计算。学院中研究生层次课程从高阶课程中选取。

凡是被美国密西根大学研究生院录取的学生都自动转入本硕连读项目。美国密西根大学并不控制这个项目的录取名额。研究生院的录取决定也由各个系独立做出，主要依据是学生的平均绩点和托福成绩，不需要 GRE 成绩。

国际交换生项目

在国际交换生项目方面，学院目前有三个项目。第一个项目是和美国密西根大学合作的暑假项目，每年夏天 5~8 月约有 20~40 名美国密西根大学工学院的学生来到上海与学院的学生共同学习。由于学院的课程与美国的课程大致相同，美国密西根大学的学生在上海获得的学分很容易就能转换成美国学校的学分，并可转换成学位要求的学分。除了上课之外，来自美国的学生还学习基础汉语、参观文化景点、与学院学生交朋友、在跨国公司或上海本地的公司实习。

第二个项目是在美国密西根大学安娜堡校区举办的为期 4 周的寒假项目项目，一般是 1 月初开始 2 月初结束（中国农历新年之前）。这个项目注重文化熏陶和英语学习。除了英语和美国文化讲座以外，学生要参观博物馆和公司，进行一些短途旅行。每年约有 20~30 名密西根学院的学生参与这个项目，其目的是为不参加双学位项目的学生提供一些国际体验。

第三个项目是德国柏林科技大学主办的为期 5 周的寒假项目项目，12 月末开始 2 月结束。该项目的重点是文化熏陶和德语学习。每年该项目的招生与美国密西根大学的冬季项目相似。

未来愿景

学院的愿景是打造一所真正国际化的研究和教育机构，全世界的学生和研究者汇聚在这里：学习知识和技能，探索科学和工程学的未知领域，培养具备全球视野和创新头脑的世界未来领袖。要达到这个目标，严谨的国际化教育是必须的。学院计划在未来几年大力扩大国际交换生项目，并扩招学位教育的国际学生，为学生提供更多的国际体验。

为了扩大国际交换生项目，密西根学院计划与世界各国的顶尖大学，尤其是工程专业卓越的美国顶尖大学，建立合作伙伴关系。通过这些项目，学院的学生可以选择在合作的大学学习一到两个学期。在国外完成课程后，学生再返回国内学院完成学位要求。同时，来自合作大学的学生也将来学院学习。学费方面，学生只需要向自己所属的大学缴纳学费。这些项目的好处是显而易见的。首先，这些项目为参与其中的学生提供了在国外大学学习的体验，这种体验很有价值。第二，来自合作大学的国际学生会与学院学生共同学习，这为在上海求学的学生提供了与国际学生互动的机会。学院正在与多所潜在

的合作大学洽谈。

除了国际交换生项目之外，密西根学院还计划大幅增加学位教育的国际学生。不断提高学院国际学生的数量。目前国际学生的比例约 3%，五年内有望提高到 20%。更多的国际学生将促进学院营造一个更加国际化的学习环境，这对学院实现其长期目标十分重要。考虑到密西根学院学生在学术上极富竞争力，我们必须坚持只招收一流的国际学生，以保证学生能在如此严格的、竞争激烈的学术环境中坚持下来。另一方面，作为一个年轻的中国机构，密西根学院尚没有足够的声誉来吸引顶尖的国际学生，特别是来自发达国家的精英生源。这一困境为我们的招生带来巨大的挑战。希望学院的飞速发展和声誉的迅速积累能逐渐克服这些难点。

毕业生的去向

密西根学院目前已经有 2010 届和 2011 届两届学生毕业。统计表明，所有的毕业生或进入研究生院继续学习深造或就业，另外有 7 名 2011 届的学生计划在 2012 年申请继续深造。

密西根学院大部分毕业生成功进入美国、中国和其他国家的研究生院深造。2010 年的 160 名毕业生中，110 名学生（68.8%）被美国的研究生院录取，16 名学生（10.0%）被中国（含香港）的研究生院录取，3 名学生（1.9%）被英国和法国的研究生院录取。在进入美国研究生院学习的学生中，90 名学生（56.6%）被全美工学排名前十的研究生院录取。2011 届的班级规模较 2010 届大，共有 276 名毕业生。其中，190 名学生（68.8%）赴美攻读研究生，119 名学生（43.1%）被全美工学排名前十的研究生院录取，26 名学生（9.4%）被中国（含香港）的研究生院录取，11 名学生（4.0%）被欧洲、加拿大和新加坡的研究生院录取。2010 年与 2011 年的统计数据显示，学院本科生教育的质量已经受到美国、中国和其他国家顶尖大学的认可。

2010 届和 2011 届毕业生中分别有 31 人和 42 人选择直接就业。他们所有人都找到了理想的工作。统计表明，一些学生去了业界知名的 IT 公司，如英特尔、阿里巴巴的研究和技术支持部门。一些学生进入了顶尖的制造业公司，如上海大众、法国雪铁龙集团研究中心、美国斯伦贝谢、通用电气、英格索兰以及国家核电工程公司。入职岗位包括设计师、质量控制工程师、外场支援工程师以及销售工程师。其它学生进入了顶级咨询公司，如罗兰贝格和四大会计事务所（普华永道、德勤、毕马威和安永）。还有一位毕业生毕业后就创业了，目前公司已经有 20 人的规模。

2010 届毕业生的平均起薪超出上海交通大学同期毕业生的 35%（2011 年的数据还在统计中）。学生扎实的工学知识、专业技能和英语能力都得到跨国公司、国有企业和本地公司雇主的广泛认可。尽管直接就业的学生只占全部毕业生的 20%，但学院学生已经因其强大的就业竞争力受到潜在雇主的注意。

学院毕业生就业的成功与学院为学生提供的各种职业规划和指导项目分不开。例如，学院专门有一位老师负责校企合作和职业指导。学院为学生就业提供了各类服务和指导，包括如何准备简历、面试和职业兴趣开发的个性化咨询。学院还提供团队咨询，鼓励学生分享面试经验、参与心理支持的团队建设。为了将学生推荐给潜在的雇主，学院定期邀请顶尖跨国公司的经理到校园中向学生介绍就业机会、与学生就就业相关话题进行互动。学院还组织学生访问各类公司。此外，学院

还邀请校外教师开设“职业指导”课程，有18个课时，课上讨论职业兴趣、性格、价值观、时间管理以及人际沟通等问题。

结语

以美国密西根大学的课程为蓝本，以打造世界一流的工学教育为己任，密西根学院白手起家，在过去五年中一步步走到今天，成为拥有1000多名学生、提供本硕博三级教育体系的教育机构。还与美国密西根大学建立了联合学位项目，搭建了多个国际交换生项目。学院的教育模式除了为学生打造坚实的工学基础之外，还强调沟通技巧、团队合作、创新思维和解决现实问题的能力。这些技能被广泛认为是工程专业职业生涯成功的关键。2010届和2011届毕业生的成功表明，学院的教育模式受到国际顶尖大学和跨国公司的认可。学院作为国际化人才培养的先驱吸引了中国高等教育界越来越多的目光，与此同时，密西根学院的教育模式对中国工程教育未来发展会有何影响也让人拭目以待。

上海交通大学密西根学院的教师管理体制

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上海交通大学密西根学院（the University of Michigan-Shanghai Jiao Tong University Joint Institute，以下简称密西根学院）的使命是以美国研究型大学为模版，开展与研究相结合的本科生、研究生教育。密西根学院的长期目标是在教学和研究上达到与美国排名前 20 名的研究型大学相当的水平。因此，学院对教师的要求也与这些美国标杆学校相似；尤其对那些资历较浅的教师来说，学院对他们的要求与中国大学中的传统想法不同。此外，密西根学院已经采用了中国高校中罕有的终身教职体制。教师薪酬在基本工资和研究资助等方面也与中国一般的薪酬体系明显存在差异。本文对密西根学院教师管理体制的相关情况进行剖析，试图呈现出密西根学院与中国一般高校做法的差异。

教师结构

密西根学院提供机械工程与电子与计算机工程这两个方面的本硕博课程，并致力于这些领域的研究。学院期望雇用 45 位左右的教师来承担这些教学研究工作。学院没有再把教师按两个专业分系，而是保持了教师队伍的整体性，特别像没有系或系主任的美国工科学院。这一组织形式也反映在委员会的结构和教师治理方式上：密西根学院有一个研究生委员会，一个本科生委员会，所有的雇用和终身教职决策都是由独立于候选人学术领域的所有教职员工共同决定。所有教师都在同一幢楼中办公，办公室相互并排，没有按照学术领域隔离开来。

这一行政管理组织形式和物理组织形式促进了学科领域之间的互动、研究合作，也有益于学生在毕业设计等课程上的交流合作。如果在学院中再进行分系，可能会对以上这些教学研究活动造成障碍。密西根学院计划在发展过程中继续保持这一组织结构形式。

密西根学院使用的教师职称头衔包括助理教授、副教授和教授，还采用了美国学术界的终身教职理念。助理教授没有终身教职的福利，而副教授甚至（在特殊情况下）教授也可能不被授予终身教职。终身教职和教师职务晋升的评审程序如下所述。

教师雇用

所有教师的选拔依据是基于他们在各自领域的发展潜力或先前展示的独立研究领导力。

密西根学院已经展示了它吸引精英人才的能力，这些优秀的候选人都毕业于世界一流大学。在学院中，一些教师已经获得了政府颁发的主要奖项，例如有五人获得了中央政府颁发的“千人计划”奖励。学院的教师都明确表示，他们在众多学校选择中唯独看中密西根学院的原因是，学院给了他们犹如美国大学所有的研究自主性。学院之所以能够吸引高水平师资队伍，很大程度上依赖于

一个宽松的学术环境。在这里，教师能够自主独立地追求前沿研究。事实上，密西根学院建立的初衷中最重要的一点是要在上海交通大学中培养出这样的研究环境，因为在学校现有的组织结构中还较难建立如此的研究环境。

申请人来自世界各地，其中大多数在美国的顶尖大学接受过教育或正在那里工作。此外，对教师的招聘没有任何地理限制。密西根学院在全球范围寻找那些已经功成名就的顶尖研究者或已经在其领域最前沿的实验室接受过训练的候选人。一般每年会收到400~500位教师的申请。

教师能否被雇用的条件与美国主要大学一样，即候选人必须展示出他们能够进行独立研究、在顶尖学术杂志发表成果、为实验室运转获取经费、积极参与行业协会、组织会议、编辑杂志、指导博士生以及成功竞标国家和国际奖项的能力和雄心。目前而言，相对于研究经费，密西根学院对筹集实验室建设经费也相当关注。

对于教师候选人的评审包括对以下几方面的评估：其教育背景、发表文章、职业动机、推荐信以及面试情况。一个内部的委员会指导整个过程，但是否做出录取的决定等，此类讨论需要所有密西根学院的教师参加。学院的学术委员会由上海交通大学密西根学院和美国密西根大学各派三位代表组成，这也是院长顾问委员会，他们会对院长是否需要雇用这些申请者提出建议，特别是在雇用高级教师的时候。

考虑到学院雇用教师的标准，密西根学院为教师提供的相应资源支持也必须和其全球竞争者一样。这样的话，就必须包括以下这些资源：启动经费、实验配套设施、高素质博士生生源、合理的教学任务量以及高品质的实验室空间。

实验室被安排在同一幢楼，这对于密西根学院作为一个机构来说非常关键。学院的实验室必须彼此靠近，还要邻近教师办公室，以促进学院教师和博士生之间、不同的实验室之间、博士生之间的研究互动。我们想要做到的是，要让来密西根学院访问的政企和学术界人士通过访问一个实验设备或者实验室，就能看到并且欣赏到学院研究的规模、质量和范围。

学院对教师的期望

科研方面

密西根学院期望所有的教师都能独立地展示他们在各自领域的研究成就。每位教师必须打造自己的研究履历，以显示其在世界学术共同体中成长为知名领袖的过程。

助理教授、副教授和教授的职称头衔也表明了不同阶段的研究成就。在密西根学院，这些头衔不是简单地按照等级制划分的，这意味着资历较浅的老师不一定需要在资历较深的手下工作。相反，助理教授可以在自己擅长的领域领导团队，那些团队甚至可以包括高级职员。学院所有的教师都需要追求自己的研究方向，而研究方向和职称头衔无关。

在密西根学院，教师可以独立自主地建立研究合作关系，这在中国不太寻常。一般来说，中国的教师是被分配到大学的研究小组或者研究所中去。教师需要合作成为研究所或研究团队中的一员开展工作，而这个研究所一般是由少数高级教授领导的、等级分明的结构。在这个结构中，教师很难有机会外延发展或者建立一个不同的研究小组，结果就是必须和同组的人合作，也不会有很多机会开展与研究所研究方向不一致的课题。相反，作为晋升和终身教职评估的关键因素

之一，密西根学院的教师需要呈现出他们独立的研究能力，即使教师很积极地和其他人合作也必须展示这一点。

事实上，密西根学院也会避免录用那些可能会接受被安排到其他研究团队的教师候选人。学院寻找的资历较浅的教师不想被分配到一个高级教师的团队；而我们想要的高级教师也不想要不熟悉的且资历较浅的教师进入他们的团队。只有给予教师选择研究合作伙伴的自由，学院的师资队伍才能更加欣欣向荣。只要合作是在地位平等的合作伙伴之间建立，而且每位参与其中的教师都能贡献其创新的智慧和能量，那么，这样的研究团队建设和合作会受到有力的鼓励和支持。

为了允许资历较浅的教师开展独立研究，密西根学院的助理教授可以指导博士生，并且从任职第一天开始就有这一权力。这和只能由教授任博导的中国学术界有明显不同。在中国，即使是有教授头衔的教师也必须通过竞争申请才能获得博导资格。

研究经费不是测量学术影响力或研究质量的方法，也不是衡量密西根学院教师研究水平的首选指标。学院关注的是教师的研究声誉、知名度和影响力。而这些是通过教师在重要领域的工作、在顶尖杂志的发表研究成果、同行评价以及学术服务建立起来的。经费能帮助实现这些目的，但不能独立成为教师国际认可度的指标。

相反，在中国的工程领域里，研究经费是研究产出的主要指标。吸引财政资源是人们关注的焦点，而经费能带来什么研究成果所受关注相对较少。这种体制重视投入多于产出。美国体制也把研究经费作为关键绩效指标。然而，美国体制则是依靠研究经费来支持学校的运营。在中国，几乎没有这样的制度。这带来一个问题，各单位需要进行能力建设，这个过程需要支出空间和设备等经费，然而单位所支付的这些成本无法从研究经费中得到，需要另找资源。

教学方面

密西根学院出于对学术和实践原因的考量，教学质量受到高度重视，教学质量也是对教师的一项重要要求。学院建立之初就仿照美国的课程体系、用英语教学，以期为本科教育探索出一个新模式。课程内容包括发展学生解决问题的能力、创造力、设计能力、团队合作能力、领导能力以及沟通能力。学生们为这个学习环境支付了昂贵的学费。密西根学院的办学经费主要来源于本科生的学费，为学生提供卓越的教学、满足学生的需求是非常重要的。

教师原则上需要在两个学期教三门课，每个学期为期 15 周。每门课一般是 4~5 个学分。每门课学生都要对教师的教学质量进行评价。目前，学院还实施额外的评估程序对教学质量进行评价，为教师提供反馈以改进教学质量。

学术专业服务

学院要求教师，特别是副教授和教授级别的教师，通过编辑期刊、组织会议、参加委员会、处理相关事务等为学术共同体服务。对于资历较浅的教师，学院鼓励他们积极参与学术专业服务以积累在学术界的名声。

教师薪酬体系

密西根学院的教师薪酬体系和美国研究型大学的一样。教师一年领 9 个月的薪水，这些酬劳分 12 个月发放。除此之外，教师还能从研究经费中获得另外 3 个月的补贴，总共是 12 个月的薪水。这是大学收入的上限。这一安排促使教师参与到受到资助的研究

中，也能避免教师对增收性的科研项目过度关注。

密西根学院教师的收入比中国的标准高，比美国工科教师的基准略低。这种安排是必要的。首先，密西根学院需要和美国的大学以及跨国公司竞争高层次、在国外受训、说英语的师资队伍，因此工资必须具有竞争力。此外，不像中国大学的薪酬体系，密西根学院的教师不能无限制地从科研项目中获得收入。最后，密西根学院对教学的要求更高，教师必须能用英语教学。

一般的中国大学和密西根学院的做法不同。有些地方，教师常常得到一份很低的基本工资，但同时学校对教学的要求也不高。教师能够通过科研项目获得个人收入，特别是从企业资助的科研项目。一般来说，受到资助的研究经费中 20%可用于支付教师酬劳，而且没有上线；这与密西根学院的情况不同，密西根学院有每年最高三个月工资的限制。在中国大学这样的安排下，即使研究的学术含量很低，教师仍旧积极争取企业资助的研究项目。如此情况下，大学的研究项目数量不断增加，这些经费统计数字对于大学排名和质量评估相当重要，但是这并非与大学原本的研究使命相一致。

终身教职和晋升体制

密西根学院的终身教职和晋升体制与美国大学基本相似。终身教职被视为密西根学院为教师提供的永久雇用承诺，除非教师犯了重大过失，比如疏于职守、欺骗行为等。为了获得终身教职，学院的教师必须在研究、教学和社会服务等各方面都满足要求。在研究方面，他们必须拥有独立的发表成果，在其研究领域有一定知名度，能够向他人展示自己研究的用处，指导博士生，作为主要负责人申请研究基金，以及在全球顶尖学术界建立声誉。

终身教职与学术职称头衔是两码事。拥有副教授或者在极少数情况下甚至是教授头衔的教师也可能拿不到终身教职。如果教师能够展现其之前的经历并得到认可，那么在其被录用时就会被授予终身教职。一般情况下，教师要经过六年的历练才能获得终身教职，但对于那些有相关研究经验的教师来说，时间可以缩短。教师只有一次申请终身教职评审的机会。除非有特殊情况，终身教职评审必须在受聘的前六年进行。如果教师的终身教职申请被驳回，他们必须在一年内离开密西根学院的教师队伍。

终身教职的评审过程以及教师的职务晋升过程是非常严密的。候选人必须按照标准模版准备其相关的学术表现的文件，这个模版和美国密西根大学的是相同的。院长将委派一个委员会收集与该教师教学水平相关的其他材料，如学生评教、学生信件等。

该委员会也会从国际学术圈中选择合适的外部专家对教师的学术贡献和影响力进行评价。至少需要五位外部评审，其中候选人的研究合作者、博导或者博士后导师等都须规避。最好是八位以上的独立评审。这些评审回函至关重要。评审们知道，申请的教师本人不会看到他们的评审信件，因此，他们可以直言不讳地评价对方的研究、研究影响力、该领域其他学者对其研究的使用情况、教师的知名度、教师未来可能获得的研究成就等。

完整的材料会在多个不同层次的评审中分发、讨论和投票。第一轮评审是在上述的委员会中，委员会的成员将准备教师在教学、研究和社会服务等各方面表现的完整评价资料。第二轮，密西根学院所有与候选人申请

职务相等或以上的教师参加公开讨论并进行不记名投票。学院的学术委员会也会参与投票，学术委员会的成员包括密西根学院和美国密西根大学的高级教师。院长最后将写一封评估信件作为总结。最后，整份材料连同各轮投票结果都将被提交给密西根学院的理事会。理事会的投票将一锤定音。

在进行终身教职和职务晋升的主要评审之前，为教师们提供一份反馈是十分重要的。所有的非终身教职教师在被聘用三年后都会经历一场“第三年评审”。这个评审和完整的终身教职以及职务晋升的评审过程相似，只是没有外部评审回函，也不需要提交给理事会作最后决策。“第三年评审”的目的是为教师以后能够成功获得终身教职提出改进意见。此外，所有密西根学院的教师，无论终身教职与否，都需要和院长或执行院长面对面进行有关年度评估的交流。

结语

密西根学院的结构组织、聘用制度、对教师的要求、学术自主性、薪酬体系和终审教职体系等与美国主要研究型大学的制度非常相近。这已经被证明有益于密西根学院成功聘请高水平师资队伍，并且能够与美国大学或中国其他重点大学相抗衡。在学院招聘教师的过程中，尤其重要的一点是教师在追求研究兴趣和建立自己的实验室等方面拥有自由和独立性，尤其是对资历较浅的教师而言。密西根学院的教师非常支持并欣赏学院提出的要求期望，即教师应该在世界学术界成就卓越，同时也会得到相关支持，对教师的评价基于研究的影响力而不是研究经费。最后，密西根学院的精英学生生源也是对教师的一大吸引力。

毫无疑问，密西根学院有立志成为国际重要研究机构的雄心，但是能否取得最后的成功有赖于它吸引和支持优秀教师的能力。从学院教师之前的经历和最新的表现来看，学院的未来一片光明，能够达到美国排名前 20 位大学的水平。

Motivation and Vision of the University of Michigan-Shanghai Jiao Tong University Joint Institute

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Overview of the UM-SJTU Joint Institute

The University of Michigan-Shanghai Jiao Tong University Joint Institute (JI) is an in-dependent academic institute offering undergraduate (BS) and graduate (MS and PhD) degrees in Mechanical and Electrical/Computer Engineering. It was founded in 2005 with the first students entering in 2006. JI has a strong research focus. While JI awards SJTU degrees because it does not possess the legal authority to do so from the Chinese Ministry of Education, it is an independent and special unit of JI. Its academic organization is unique in that the JI Dean reports directly to a Board of Directors, not to the chief academic officer of either partner university. The Board is the controlling authority on all major decisions (see related article in this issue on JI governance). On matters of non-academic internal operations and facilities, JI functions as a school within SJTU.

The students are among the elite within China, entering JI only after passing the rigorous admission standards of SJTU. The undergraduate curricula are taken from the University of Michigan. The graduate program is based on degree requirements and expectations at major US research universities. All instruction is in English.

JI has its own faculty that is independent of the faculty that exists within SJTU's cur-rent mechanical and electrical engineering schools. JI faculty do not have appointments at UM. JI employs a tenure system similar to that at UM, and achieving tenure depends on excellence in research, teaching, and service.

JI offers complete four-year BS degree programs based on 128 semester-credit hours with 15-week semesters. About 70% of JI students complete their studies entirely at JI. The remaining 30% of JI students participate in a dual-degree program with UM, where the students must complete dual majors in different disciplines, one at each institution, in order to receive both degrees. Each year 30-40 UM students study at JI in summer semester.

JI undergraduate students have had stunning success with admission to prestigious graduate schools, the primary choice for JI alumni, and positions at multinational companies that value the bilingual ability of JI students, their familiarity with US customs and communication style, and that JI students have studied UM's ABET-accredited curriculum.

Why and How JI was Created

The partnership between the University of Michigan (UM) and Shanghai Jiao Tong University (SJTU) as evident in JI is based on shared features of the two partner institutions as well as a vibrant prior history that spawned the JI.

Connections Between the Partner Universities

UM and SJTU each saw in the other comparable institutional characteristics that are valuable for effective cooperation. First, each of UM and SJTU are large, comprehensive re-search universities. Second, while the concept of public and private university does not apply to China's university system, SJTU

wanted a partnership with a public US university be-cause it believed such a university would share the same institutional perspective and would better understand the role of government input and funding that exists in China. Third, both universities are among the prestigious elite within their country. Four, each of UM and SJTU have renowned engineering programs. UM is consistently ranked among the top few among US engineering universities. SJTU's mechanical engineering program has been ranked number one in China for several years, and its other engineering programs are among the top few.

SJTU sought a partner university from which it could learn and adapt methods to bet-ter establish itself as a research university in the US style, and UM has achieved the research strength that it desires.

History behind the Formation of JI

The significant UM and SJTU partnership from which JI evolved started in 2000. That cooperation was to draw on UM's experience and academic staff to develop its mechanical engineering school. Faculty, school leaders, and administrative staff from SJTU spent significant periods at UM. UM faculty members came to SJTU to teach classes. A group of under-graduates was selected as a pilot class to introduce major elements of UM's mechanical engineering curriculum in a test setting. The depth of this sustained interaction developed the familiarity and trust needed to launch an initiative as significant as JI.

It is imperative for such a major initiative to have the dedicated drive of a few individuals on each side. Among a number of people that committed enormous energy, three people were and are especially important as the point people in the relationship. SJTU's cur-rent General Secretary, Madame Ma Dexiu, and Deputy President Zhongqin Lin, who was the Dean of Mechanical Engineering when the partnership developed, have pushed the development of JI within SJTU. JI's current Dean, Jun Ni, who remains a UM professor, is an SJTU BS graduate known well to leaders at both universities. Dean Ni spearheaded the UM participation since 2000. The ongoing cooperation and drive of these leaders is a major factor in creating and sustaining JI.

With the success of the pilot program in mechanical engineering, the institutions negotiated the concept of JI. The goals of JI and the benefits motivating each university are discussed below. The signing ceremony establishing JI took place in Shanghai in June 2005 with a number of major central and Shanghai government representatives joining the senior leaders of UM and SJTU. The Chinese Ministry of Education gave their approval in February 2006. The JI was publicly unveiled in April 2006. The first students, a bold group of 196 students gambling on the novel concept of JI, arrived in September 2006.

Goals of JI

The JI was conceived with the vision of excellence in all aspects. The Board reminds the JI leadership team of this regularly at Board meetings.

Becoming a world-class engineering research and education institute: This objective requires a vision of excellence in students, faculty, facilities, and expectations. JI selects from the top tier of students that enter SJTU, and its average student quality exceeds that of SJTU engineering overall. The faculty are hired at the standard of major US research universities (see related article in this issue on JI faculty). The graduate program and leading edge re-search are equally important as training excellent undergraduates. Laboratories will be at international standards.

Training students as future leaders: The JI curricula are taken from UM's ABET-accredited curricula and integrate professional skills such as written and oral communication, creativity, open-ended problem solving, teamwork, leadership, and ethics into the classes. The purpose is to give comprehen-

sive, not only technical, training to prepare students for their careers. This holistic approach is unique in China where textbook problem solving and exams dominate.

Third, equal to the top-20 US research universities: JI's self-chosen peer group is the top-20 US universities according to US News & World Report rankings. This is the group with whom we want to be compared, and this is reflected in decisions related to faculty hiring, faculty expectations for research, teaching, and service, research development, and curricula.

Implement the US academic system in China: One of the notable differences between UM and SJTU is the student development during their academic career. The academic ability of entering undergraduate students at SJTU greatly exceeds that at UM, but the academic quality at graduation is perhaps greater in the US system, at least when considering the high performers. The value added is greater in the US. By pioneering the US style of education in a complete four-year program, JI seeks to add comparable value while starting with entering students at even higher academic level. The differences in graduate education between the Chinese and US systems are similarly stark, with the US system recognized as a world leader in graduate training. JI is introducing the US model into China with several distinct differences compared to Chinese graduate programs.

Become a center for international exchange of students – From its foundation, JI is an international institute. This is clear not only from the UM and SJTU partners but also in the international mix of students, faculty, and staff operating a US-style institute in English while located in China. JI seeks to create numerous international partnerships beyond the massive student exchange in both directions between UM and SJTU. JI plans to form student exchange and cooperative degree programs with leading universities in the US and Europe.

Unique Features of JI as an International Partnership

JI has unique features that, taken as a whole, distinguish it from any other engineering partnership between overseas and Chinese universities. The primary ones include the follows. First, JI offers comprehensive undergraduate and graduate programs, including a re-search focus. Second, students are recruited at the high standard of SJTU. Students cannot enter JI without first being admitted to SJTU. Other prominent partnerships in engineering do not enforce such rigorous admission standards. Third, there is no profit motive for either UM or SJTU. UM does not provide funding, nor do they receive any funds in return. SJTU subsidized the initial development of JI, but JI is financially independent in its steady state operation. Fourth, faculty are permanent staff recruited at the standard of leading US universities. Five, JI answers to a Board of Directors with equal representation from UM and SJTU. JI maintains a close connection with UM in all academic matters, faculty selection, and major decisions. This connection is described briefly below and in a related article in this issue on JI governance.

Organizational Structure

A Board of Directors consisting of five senior leaders from each of UM and SJTU formally governs JI. This Board is the authority on all strategic planning and major decisions. They make the final recommendations on faculty tenure and promotion. The JI Dean, who is currently also a UM professor, is appointed by and reports to the Board. The Dean does not report to the chief academic officer at either of UM or SJTU, making JI an academically independent institute. The Dean appoints a leadership team within the institute. He/she is advised by an Academic Program Group consisting of three senior faculty members from each of UM and JI. The Academic Program Group meets bi-weekly by teleconference.

What do the Partner Universities Seek from JI?

UM's objectives include the following.

First, JI will become a high quality institution for UM engineering students to study side-by-side with Chinese students, in English, with a curriculum that meshes with that at UM. This was UM's primary objective for JI at its founding. It is being achieved through JI's Summer Program where UM students, and increasingly students from other US universities, study at JI in summer.

Second, JI will internationalize the engineering student body at UM. Nominally about 200 JI students, 100 of each of third and fourth year students, study at UM at any given time through a dual degree program. These students are stellar performers, achieving an aggregate grade point average of roughly 3.8/4.0 compared to UM's engineering average of 3.2/4.0. There are two major side benefits of this program. First, these excellent students are entering UM's graduate program in large numbers. In addition, they are paying non-resident tuition at UM, which exceeds USD35,000 per year per student.

Third, JI will achieve global prestige. China is universally acknowledged as a rapidly growing economic and technical powerhouse, and UM wants to establish its presence there for a variety of institutional objectives. JI is a high visibility initiative in China that is recognized for academic excellence. The association with UM projects the UM brand into China.

Fourth, JI will promote research cooperation. Engineering research is expanding dramatically in China, and this includes multinational companies that are establishing large re-search centers in China. A meaningful share of academic research that previously occurred in the US will shift overseas, and China is a major beneficiary with its technical prowess and established university system that is adapting and advancing its research capacity. JI gives UM a large presence at one of China's premier universities and a selection of likely collaborators in JI faculty members. UM and SJTU currently fund a USD6M cooperative research program to create collaborations in clean energy and biomedical technology.

SJTU's objectives are as follows.

First, JI means research prestige and academic drivers of technology development. China has strived for years to increase its academic research impact and establish one or more internationally prestigious universities. The motivation is to transform to an economy driven by innovation and entrepreneurship rather than manufacturing and reliance on its vast workforce. The education and government leaders are disappointed with the results of past investments. JI has research as part of its core mission, with the expectations of faculty and measures of performance based on the standards of top-20 US universities.

Second, JI will become a model to learn the US research university model. Some of the difficulties in developing an internationally famous research university in China result from decision-maker inexperience with such institutions. The knowledge base to create a top-tier research university is lacking when viewed broadly across all policy makers (although of course many individuals possess the requisite knowledge). JI provides an test platform to develop ideas that have been effective in US higher education and introduce them to SJTU. This is why autonomy to pursue its unique mission is fundamental to JI's objectives.

Third, JI will become an agent for change in a system where change is difficult. Engineering schools in China are extremely large. For example, SJTU Electrical Engineering has approximately 500 faculty teaching staff and 7500 students. SJTU Mechanical Engineering has about 300 faculty members. The size of such programs makes it extremely difficult to change them, even if massive resources are injected. JI can develop its curricula, graduate programs, faculty, and research from the begin-

ning with the research university model in mind. As it grows it influences other schools on campus to adopt successful methods. JI's influence is already evident at SJTU despite its short existence, and SJTU leaders envision its influence to grow.

Milestones and Current Status

Students and Degree Programs

For students and degree programs, JI offers and fully staffs the instructors for BS, MS, and PhD programs in Mechanical and Electrical/Computer Engineering. JI enrolls 250-300 new undergraduates each year. The first two classes of JI students graduated in 2010 and 2011 with exceptional post-graduation opportunities. The primary choice of JI alumni is to attend graduate school with a large percentage accepted by elite US universities.

The Dual Degree program offers JI students the opportunity to pursue two degrees in two different disciplines from UM and SJTU. Students study 2.5 years at JI and two years at UM, receiving separate diplomas from each university. Approximately 100 students enter this program each year for a total number of about 200 JI students at UM. UM and JI staff cooperate closely to advise the students.

JI's Summer Program admits students from UM to study alongside JI students in engineering classes during summer semester, a primary academic term in JI's calendar. Approximately 30-40 students participate each year. The UM students also take classes in Chinese language and culture. JI is expanding this program to accept students from other universities.

JI students can opt for a combined BS/MS degree in cooperation with UM. The pro-gram requires an additional one year of graduate study at UM following completion of the JI degree. Up to six credits of appropriate graduate courses taken at JI can simultaneously count toward the UM MS degree. Admission is competitive and based on departmental graduate admissions processes. This program is extremely popular with JI students and provides a stream of top quality students into UM's graduate program, often with students self-paying and requiring no financial support in their first year.

JI has about 50 graduate students, with about 25 in each of its first two entering classes. JI seeks to rapidly expand this number to meet the needs of growing faculty re-search, but the rate is restricted by JI's emphasis on student quality and quotas imposed by the Chinese Ministry of Education and established graduate school admission practices in China.

Faculty

JI has 20 faculty members spread across mechanical and electrical/computer engineering. Its objective is approximately 45 faculty members. Combined with a team of eight engineering, English, and humanities/social science lecturers and isolated supplemental contracts with qualified SJTU faculty members, JI can teach its two undergraduate curricula, including math and the sciences, and the fundamental graduate courses. The profile of the faculty is given in a related article in this issue.

Staff

JI currently has approximately 25 administrative staff. The ratio of staff to faculty is necessarily large during JI's initial development because, while small in faculty number, JI must operate all the functions of an institution, including payroll, finance, human resources, student recruiting, academic management, student affairs, student counseling, a graduate program, a research office, communications and promotional materials, international pro-grams, and secretarial functions. JI employs an Executive Director with primary responsibility for staff management.

Governance, Resources, and Management of the University of Michigan-Shanghai Jiao Tong University Joint Institute

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The University of Michigan-Shanghai Jiao Tong University Joint Institute (JI) is a collaborative international institution that is developed, operated, and overseen by both parent universities. It was founded in 2006 with the mission to be a research institution in the mold of major research universities in the US. Both parent universities give it broad autonomy to pursue this mission. JI is introducing a system of academic governance that is unique in China. While it is an independent institute, JI is located within Shanghai Jiao Tong University (SJTU) and awards SJTU degrees. Accordingly, it is sometimes con-strained by the established procedures and institutional organization of SJTU. This article describes JI's governance procedures, its source of funding, and the operational management of JI as a unit of SJTU.

Governance

The governance of the JI occurs at four levels: the Board of Directors, the JI internal management team led by the Dean, the Academic Program Group, and direct faculty input, each of which are discussed below.

An unusual aspect for academic institutions within China is that there is no direct oversight of JI from the Chinese Communist Party. While universities, colleges, departments, and administrative units in all Chinese universities include a staff member representing the Communist Party, JI has no such officer. This reflects the charge that JI be independent and creatively non-traditional in its development as well as the fact that UM and SJTU are equal partners in JI.

Board of Directors

The JI is governed by a Board of Directors (or Board), which has final decision-making authority on major issues. The Board membership consists of five senior leaders from each of the University of Michigan (UM) and Shanghai Jiao Tong University (SJTU). Currently, the Board of Directors include: President Mary Sue Coleman, Provost Philip Hanlon, Dean of Engineering David Munson, Dean of Medicine James Woolliscroft and Dean of Literature, Science, and Arts Terrence McDonald from UM; General Secretary Ma Dexiu, Deputy President Lin Zhongqin, Vice President for Education Huang Zhen, Vice President for Research Zhang Wenjun and Vice President for Medical Affairs and Dean of Medicine Chen Guoqiang from SJTU.

The Board meets approximately twice per year with one meeting typically taking place by videoconference. Attendance and participation in the meetings is generally excellent. The meeting purposes are to review important developments, establish major goals, align Board member opinions on important academic, budgetary, and facilities is-sues, vote on and formally approve all tenure and promotion cases, and guide the Dean in implementing the Board's expectations. The agenda is established with the advice of the Dean and Academic Program Group (discussed subsequently). At each meeting, the Dean presents the state of affairs of the JI and the status of important developments since the previous meeting. Discussion

time is allotted for agenda items requiring Board decisions. Examples of matters addressed by the Board include: budgets, student enrollment and quality profile, space for research, offices, and teaching, lab facilities, faculty hiring, and cooperative academic programs.

While the Board meetings provide the benefits of direct discussions among the Board and formalize decisions on key issues, the Board participation in governance occurs regularly throughout the year. The Dean frequently communicates and meets with individual Board members at UM and SJTU on matters of topical importance and when action from individual members is necessary and appropriate. Given the visibility and importance of JI within both parent institutions, these discussions and the overall state of JI are passed among Board members within each institution through the normal interactions among the leaders serving on the JI Board.

JI leadership Team

The Dean is appointed by and responsible to the Board of Directors. He/she is responsible for the development and management of the JI on all matters, including faculty and staff hiring and organization, student affairs, academic programs, budget, and facilities. Because JI is an independent institution, the JI Dean reports to the Board but not to the Provost/VP for Education at either parent university.

Since the founding of the JI in 2006, the Dean has been Jun Ni. Dean Ni is simultaneously a Professor at the University of Michigan where he has been a faculty member since 1989. He divides his time between the two institutions while remaining in contact electronically. This arrangement with physical presence at each of UM and SJTU facilitates regular communication with all Board members. Dean Ni was re-appointed by the Board in February 2011 to serve through May 2014. The Dean has flexibility to organize the management team within the JI.

The Executive Dean, nominated by the Dean and appointed by the Board, is responsible for on-site management of JI in the absence of the Dean. In addition, this role includes oversight of Academic Affairs including tenure and promotion, faculty hiring, faculty annual reviews, budget management, and development of academic programs. Prof. Robert Parker currently holds this position.

The Associate Deans for Education and Research complete the academic management team. The Dean appoints them. The Associate Dean for Education, currently Prof. Peisen Huang, manages issues related to instruction, curriculum development, and the graduate program. He is the liaison with SJTU for academic issues, and this function is substantive because the JI functions academically as a unit within SJTU and JI students receive SJTU degrees. The Associate Dean for Education works closely with the two chairs of the Undergraduate and Graduate Committees as well as JI's Academic Office that functions in the role of registrar. The Associate Dean for Research, currently Prof. Zhao Wansheng, manages all aspects of research development, including space and facilities, coordination of research policies, management of JI research staff, and formation of collaborative teams, including those with faculty elsewhere in SJTU.

The Executive Director at the JI manages all staff operations, staff hiring, and employment policies. Pam Byrnes currently holds this position. The staff is organized into three offices: Academic Office, Resource and Finance Office, and External Relations Office.

Academic Program Group

The Academic Program Group (APG) is an advisory panel for the JI Dean. The 2008 JI operating agreement between UM and SJTU states that "During the early years of the Joint Institute, before a faculty body of adequate size to convene a faculty executive committee is available, the JI Dean will be guided in issues of academic affairs by a small group of senior

faculty representing the JI and the two partner institutions." In addition to its advisory function, the APG is critical in connecting JI and its progress to decision-makers at UM. The current APG members include: Associate Dean of Engineering for Undergraduate Education James Holloway, College of Engineering Faculty Adviser to International Programs Volker Sick and Associate Dean of Literature, Science and Arts James Penner-Hahn from UM; Executive Dean Robert Parker, Associate Dean for Education Peisen Huang and Associate Dean for Research Zhao Wansheng from SJTU.

The APG meets nominally every two weeks by teleconference. APG members meet in person a few times each year when travel plans permit. The APG discusses the full range of institutional decisions, challenges, and opportunities that arise at JI. The dual purposes are decision-making and communication to UM. Significant emphasis is put on curricular development, in particular the interfacing with UM on the Dual Degree and Summer Programs that require detailed coordination. Major policies and procedures related to faculty appointments, promotion, and tenure are formulated in cooperation with the APG. The APG reviews and advises on all JI faculty hires. It currently has a formal role with tenure decisions with their evaluation forwarded, along with faculty and Dean input, to the JI Board for the final decision. In this aspect, the APG functions similarly to a college level promotion and tenure committee at US universities. The APG holds strategic planning discussions to further develop the JI. It assists the Dean in planning the Board meeting agendas. The APG advises on expanded international academic cooperation to create new programs with other US universities, new forms of the Dual Degree program, combined BS-MS programs with UM, and building such programs with other UM colleges.

As originally envisioned during the planning of JI governance, the APG is temporary until JI has sufficient breadth and seniority in its faculty ranks to form an executive committee to represent the faculty in important matters and to advise the Dean. This executive committee of faculty members elected by the JI faculty will eventually assume the functions of the APG, and the APG will be dissolved or its role diminish accordingly. Some shifts have already occurred as the JI faculty has grown such that it can express its voice through traditional internal governance discussions typical of US universities. More mature committee structures developing within the JI also affect the decision-making balance with the APG.

Faculty Governance and Committee Structure

JI currently has no departmental structure to distinguish its two degree programs in Mechanical and Electrical/Computer Engineering. The relatively small size, currently 20 faculty members with an initial goal of approximately 45, permits this. To the extent possible, this state will be maintained as JI grows for a few important reasons. One is to maximize faculty cooperation and collegiality with an environment where all faculty and staff view themselves as collectively part of JI rather than units within JI. A second reason is to promote collaboration on interdisciplinary research and encourage formation of groups exploring novel fields that take advantage of expertise in both disciplines. Finally, this arrangement deploys resources efficiently with minimal redundancy.

The JI has the following standing committees: Faculty Search Committee, Graduate Committee, Undergraduate Committee, Space and Facilities Committee, Faculty Committee on Discipline, and Honors and Awards Committee.

These committees are the major instruments for faculty governance, in addition to open dialog at faculty meetings. The committees are staffed by members of the faculty including, where appropriate, non-tenured faculty lecturers who are key contributors in some committees. The Dean and Deputy Dean appoint the committee members. These commit-

tees are independent of the APG, although proposals initiated in them may be brought to the APG for discussion.

As discussed above in relation to the APG, JI will eventually form an executive committee elected by the JI faculty. This will provide greater faculty representation in the major decisions.

A critical aspect of faculty governance involves tenure and promotion decisions. A faculty member being reviewed provides the necessary information to a casebook committee personalized for that specific review. The Dean appoints this committee of faculty members. Casebook committees are fundamental to assembling a comprehensive package that includes external evaluations and internal teaching assessments, in addition to the research documentation provided by the candidate. All faculty at appropriate rank meet to discuss openly the merits of the casebook and subsequently participate in a closed ballot that is added to the casebook when forwarded to the next level of review. All untenured faculty members undergo a comprehensive 3rd Year Review where faculty at appropriate rank review and vote on each of these cases as well.

Coordination with SJTU Academic Affairs

Although JI is nominally an independent institution with autonomy for its own academic development, the degree-granting authority for SJTU students resides with SJTU and JI faculty are formally employed by SJTU. As a result, there are issues where JI decisions and policies must be coordinated with SJTU. One of SJTU's goals for the JI is to learn and possibly adopt concepts drawn from the US academic system, and academic issues are a conduit to relay those ideas.

On matters of undergraduate curriculum and MS/PhD program requirements, the JI has nearly complete autonomy to define the graduation requirements. Only two meaningful issues arise from operating as a unit within SJTU. The first is that students must complete 22 credits of coursework required by China's Ministry of Education, in addition to all JI degree requirements based on the 128-credit curricula from UM. The Ministry of Education courses involve politics, military, and physical education. The second curricular issue is one where JI was approved by SJTU to vary the graduation thesis nominally required at SJTU and throughout China. Instead of an individual project and thesis, JI students work in teams with faculty advisers in the mode of a senior capstone design course and produce a collective thesis and a hardware prototype.

In matters of faculty promotion, SJTU automatically recognizes the JI selection of Assistant Professor, Associate Professor, or Professor at the time of hiring. The JI tenure and promotion review procedures are based solely on processes defined by JI and do not involve SJTU faculty external to the JI. Nevertheless, JI must demonstrate to SJTU that its review procedures are rigorous and appropriate. Given that JI has yet to internally promote a faculty member between the three academic ranks, there is little basis to determine if conflicts between JI and SJTU may occur in faculty promotion matters and how the matter would be resolved should there be disagreement. The potential for disagreements exists because JI and SJTU have different bias in how they evaluate research accomplishments and research impact. The JI uses metrics typical of US research universities with strong focus on external evaluation letters.

JI students are formally students of SJTU as well. On academic matters where a written JI policy differs from an SJTU policy, the JI policy governs. In all other matters, SJTU policies govern. One notable non-curricular difference is the JI Honor Code governing academic dishonesty or misbehavior. The JI's policy is distinctly different than that of SJTU in expectations and implementation, although SJTU has indicated it may move toward the JI system.

Resources

The primary source of funding for JI is undergraduate tuition. All tuition paid by JI students is returned to JI for use at its discretion. The tuition, currently at 30,000 RMB/year for Chinese citizens, is five or six times higher than tuition paid by other SJTU students. Thus, other SJTU schools rely on central administration funding that is not available to JI.

In the startup phase of the JI, SJTU has provided an additional subsidy that will not continue after the JI reaches steady state in its initial growth projection of 45 faculty members, 1600 undergraduate students, and 200 graduate students.

The University of Michigan does not provide any funding, nor does it receive any funds from China or the JI. Its direct contribution beyond the value of its prestige, is a great deal of support for the administration of the JI through: allowing Dean Jun Ni (a UM professor) to serve as the Dean, Board of Directors participation, APG participation, providing the model for JI's undergraduate curricula, and significant cooperation with UM staff on joint academic programs.

There is no return to JI of indirect costs associated with research projects. Re-search funds that a faculty member receives, net of the indirect cost money taken by the SJTU research office, are used solely by the faculty member for the conduct of the re-search. This handling of indirect costs is a concern because there is no financial return to JI of expenses associated with building research capacity, including payments to SJTU for use of research space.

JI is free to accept donations from corporations or individuals. It has received gifts from both, but these are not yet a significant part of JI's funding model.

In terms of facilities and buildings, the JI is located in a building on the main campus of SJTU. This building is shared with SJTU's law school. It is suitable for faculty offices and some research labs, but it lacks facilities required for some research labs. Currently JI has acquired pockets of research space distributed around campus and pays SJTU for use of that space. Such a distributed arrangement has significant disadvantages for research cooperation, faculty recruiting, student recruiting, and maintaining faculty cohesion through collocation. Long-term resolution of the space problem is under active discussion with SJTU.

In addition, JI relies on SJTU for a number of resources other than funding or infrastructure. Examples include: dormitories (for which JI students pay the same as SJTU students), library, athletic facilities, dining halls, research grant management, student recruiting assistance, employment matters for faculty and staff (e.g., payroll, taxes, visas, etc.), purchasing, tuition processing, and similar functions of a large university. The JI uses these resources at no charge in the same way as other academic units at SJTU.

Management Coordination with SJTU

Although JI is an independent institution in its academic operations, faculty and staff selection and organization, and use of funds, its functional operations are handled in the context of being a unit of SJTU, much like the operations of other schools at SJTU. As a result, JI inherits many policies formulated by SJTU with regard to financial processes, human resources, purchasing, travel, and the like. This arrangement has enormous benefits to the JI, but it is also restrictive in many ways.

The benefits to JI result from ready availability of classrooms, labs, library, dormitories, research support services, payroll and tax operations, human resource functions, student recruitment mechanisms, purchasing processes, student services, registrar functions, and the whole range of additional needs of an institute. Separately establishing such services and facilities takes large funding and a long time. Access to these items allowed JI to start with relatively small initial investment and remarkable speed, with the first students enrolled one year after

signing of the UM and SJTU institutional agreement.

Nevertheless, JI's unique mission and different operations in academic and faculty/staff matters frequently create issues that constrain JI. One major area of difference arises from JI's differing faculty promotion system and faculty expectations. JI follows a tenure-based US-style academic ranking system of Assistant Professor, Associate Professor, and Professor. Junior faculty members are expected to develop an independent re-search program from the time they arrive. This includes supervising PhD students. Appropriate processes of internal evaluation, external letters, faculty voting, and final approval by the JI Board govern hiring into the appropriate rank and promotion between ranks. JI faculty members are, however, also SJTU faculty members. Consequently, SJTU policies on such issues sometimes conflict with the US-style system of JI. These matters often require the involvement of senior SJTU leaders.

Other areas requiring special handling include, for example: a) coordination of registrar functions, transcripts, graduation, etc. because JI has a distinctly different length of semester and timing of semesters, b) Graduate program rules where JI requirements based on a US system differ from rules established by the SJTU Graduate School, c) Finances, where JI operates relatively autonomously with a budget derived from tuition but sometimes confronts fund usage restrictions established for units of SJTU that are funded much differently, and d) Matters of faculty compensation associated with JI use of the US model of 9-month salaries with up to three months of off-semester salary from research grants (SJTU engineering faculty have a much different compensation system).

These issues are manageable and frequently occur because the managers and staff within various SJTU support services on campus treat JI as they do other SJTU schools without knowledge or authority to treat JI differently based on decisions made by the JI Board that includes the voices of SJTU's senior leaders.

Conclusion

The JI governance structure is adapted to the unique situation where the chain of command within JI through the Board of Directors mimics that of an independent university, yet JI must also operate as a school within SJTU. In virtually all matters of major importance, JI is granted autonomy to develop itself according to norms and practices typical of US research universities. This is essential for JI to achieve its goals. In fact, one purpose of JI is to be an experimental platform for institutional reform within SJTU and freedom to differ is inherent in that. In assessing the feasibility of duplicating the JI mod-el, one must clearly recognize the importance and value of having an independent Board that is the ultimate authority on major decisions and sets the overall JI strategy.

The Education Programs of the University of Michigan-Shanghai Jiao Tong University Joint Institute

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The mission of the University of Michigan-Shanghai Jiao Tong University Joint Institute (JI) is to establish a highly reputable institution for innovative engineering education and research. It is pioneering an independent educational system within Shanghai Jiao Tong University (SJTU). With the unique program curricula modeled after the University of Michigan (UM) and an English learning environment, the JI creates a unique academic institute that is viewed as pioneering by university and government leaders in China.

Undergraduate Education

JI's undergraduate program started in the fall of 2006 with an enrollment of approximately 200 freshmen students. After 5 years of development, it has now grown to a size of approximately 1,000 students. Its reputation as a highly competitive and fully internationalized engineering program has also grown substantially, which enables it to attract top-notch students in China.

The objectives of JI's undergraduate program are to: provide students with a comprehensive engineering education that builds a solid foundation in their chosen field of study; emphasize open-ended problem-solving skills, design innovations, and critical thinking; promote teamwork, communication skills, professionalism, ethics, and environmental awareness; create extensive co-curricular opportunities that cultivate lifelong learning skills and academic research ability; and offer ample choices of technical and general electives to broaden students' knowledge base.

Degree Programs and Curriculum Design

The JI offers two undergraduate programs leading to the Bachelor of Science (BS) degree in Engineering: Electrical & Computer Engineering (ECE) and Mechanical Engineering (ME). Within the ECE and ME program curricula, JI also offers two jointly sponsored international programs with the UM: the Dual Degree (DD) program and the UM-JI combined BS/MS program. The following paragraphs describe the details of the undergraduate programs in ECE and ME. The DD and combined BS/MS programs will be discussed in the next section.

The curricula for both the ECE and ME programs are modeled after those of the EECS and ME departments at the UM. All the courses offered by the JI are taught in English. Most of the courses, including engineering, science, and humanity & social science courses, are recognized by the UM as equivalent to corresponding UM courses and therefore the credits can be readily transferred.

The ECE program at the JI is an interdisciplinary program and is supported by the EECS Department at the UM. It covers all the core requirements of both the EE and CE pro-

grams at the UM. This program places emphasis on both hardware and software technology, and students' capability of creatively using the knowledge learned in classes to solve real-world problems. A flexible curriculum allows students to focus on a wide variety of subject areas within the field. Throughout the program students work with modern laboratory equipment and computer systems and are exposed to the most recent technological developments in their field of study.

The ME program at the JI is supported by the ME Department at the UM. It provides students with an excellent foundation in the core technical areas of the discipline: thermal and fluid sciences, solid mechanics and materials, dynamics and control, and design and manufacturing. Through its Design and Manufacturing and Mechanical Engineering Laboratory course sequences, the program also expose students to teamwork, technical communications, design innovations, and open-ended problem solving. In addition, an array of technical electives is offered to enable students to tailor their mechanical engineering education to best suit their career goals.

The JI curriculum for each program consists of 150 credits divided in several categories, including courses required for all programs, core major courses, program subjects, humanity & social science courses, technical elective courses, as well as general elective courses. Out of the 150 credits, 128 credits are required by each program. The remaining 22 credits are required by the Ministry of Education and are earned from specific courses in humanity & social science, English, and physical education.

The JI offers courses in unique ways to ensure teaching quality. For example, it offers regular and honor series of math and physics courses in parallel to suit students at different levels. For some courses, it involves multiple faculty members (e.g., an engineering instructor plus a technical communication instructor) to co-teach a single course. It may also offer a course in multiple sections with different instructors and smaller enrollments.

The unique features of curriculum design at the JI can be summarized as follows: introducing open-ended design problems in various courses to cultivate students' creativity and problem-solving skills; using team-based course projects to foster students' teamwork spirit and project management ability; integrating engineering and technical communication contents in courses with lab or project components to enhance students' communication skills; creating project opportunities in a close-to-real-world engineering environment to improve students' ability as future practicing engineers; collaborating with multinational companies to provide students with opportunities of direct interactions with practicing engineers, thus enhancing their skills for solving real-world engineering problems.

Instructors

JI's undergraduate program is supported by its excellent faculty team as well as faculty members from the UM and SJTU. Among the 92 instructors, who taught courses at the JI so far, 33 were from the UM, 23 from the SJTU, 4 were invited visiting professors from other international universities, and 32 were JI's own faculty members. The UM faculty members who came to teach at the JI have made a great deal of contributions to JI's undergraduate program. Most of them taught core program subjects during the JI summer semester. They brought with them modern teaching methods and created a UM style teaching and learning environment that benefits JI students. The JI also maintains good cooperation with qualified faculty members from various schools of SJTU. They teach courses at the JI on an "as-needed" basis during all three JI semesters.

The JI has been investing significant efforts in recruiting its own faculty team and has been successful in hiring world-class faculty members from different countries. It applies the same standard in faculty recruitment as the UM.

All the faculty members hold a terminal degree from famous international universities, and could otherwise be employed by other top universities in the U.S. or other countries.

All JI faculty members, including three One-Thousand-Talent Program Scholars, offer undergraduate level courses on a regular basis. In addition to the lecture hours, faculty members welcome students to extend classroom discussions to their offices and are frequently involved in supervising student research and design projects. JI students also have many opportunities to work with outstanding faculty members on cutting-edge research projects.

Administrative Support

JI's undergraduate program has been guided and supported by the following management hierarchy:

The Academic Program Group (APG), which consists of members from the leaderships of the JI and UM College of Engineering (CoE), plays a vital role in the management of the JI. All important issues related to the undergraduate program, such as faculty hiring, curriculum design, UM instructor recruitment, international program development, student advising, etc., are discussed and decisions made in its biweekly Skype meetings.

Undergraduate Committee (UC) is responsible for curriculum design, academic policy adjustment, course offerings, and day-to-day management of the undergraduate program. The UC has formed a platform for smooth and effective communications both internally and with the UM and SJTU to ensure the best education for undergraduate students.

The Academic Office is one of the most important offices at the JI. It provides academic related services to all teaching staff and students. It also plays an important role of coordinating with both the UM and SJTU regarding detailed academic arrangements.

The Program Advisors work with the Academic Office to provide students with academic advising throughout their 4-year study at the JI. The Program Advisors also handle academic requests from students in certain specific cases.

The Student Affairs Office and Student Counselors help students with their university life and future career planning.

Part-time Student Mentors are employed to provide support to students on academic as well as non-academic issues, with timely help, guidance, and supervision.

Effective feedback and communication channels have been established among the Student Mentors, Student Counselors, Program Advisors, Academic Office staff, and students and their parents to ensure a healthy study and living environment at the JI.

Quality Control Mechanism

Course and instructor evaluation mechanisms are well established with the help of carefully designed course and instructor evaluation tools. Feedbacks from students are delivered to instructors as well as JI management team. Evaluation results will be important reference information for faculty tenure review, promotion, and merit raise.

Teaching assistants assume important responsibilities such as grading, leading lab sessions, and teaching recitation classes. The quality of teaching assistants directly affects the quality of course delivery. The Academic Office together with the Center for Learning and Teaching (CLT) has developed rigorous policies regarding TA hiring and management, including recruitment and interview procedures, contract management, duty assignment, trainings, guidance and supervision, evaluation and compensation, etc.

CLT is a newly founded unit at the JI. Its mission is to provide support to the instruction staff including TAs and help them improve teaching quality. It tailor-designs teaching and learning services to match the particular institutional environment at the JI by adapting best practices currently established at many top universities in North America. Typical CLT

activities include round-table teaching seminars, TA training conferences, teaching observations, teaching related surveys, etc. CLT has also established close ties with the Center for Research on Learning and Teaching (CRLT) at the UM and the Center for Teaching and Learning Development at SJTU.

Unique Courses

JI's curricula, which model after UM's curricula, has many unique features as compared to similar programs in China. This section uses two example courses, the Introduction to Engineering and the Capstone Design courses, to show the uniqueness of JI's curriculum design. Both courses are taught in a way not commonly used in a typical Chinese engineering curriculum.

The Introduction to Engineering course is a freshmen course designed to provide students with their first taste of being a practicing engineer. It emphasizes real-world problem solving, teamwork, communication, and creativity. Multiple sections are offered, each with an engineering theme selected based on the expertise of the engineering instructor. One unique feature of this course is that technical communication contents, which are taught by a technical communication instructor, are seamlessly integrated with engineering topics. Through two team-based, open-ended design projects, students learn not only how to solve engineering design problems, but also how to write project reports and make oral presentations effectively. The hands-on nature of the projects is also intended to stimulate students' interest in engineering and make their forthcoming studies more purposeful and meaningful.

The Capstone Design course, on the other hand, is a project-based course designed for senior students. It emphasizes many of the same skills as the Introduction to Engineering course, such as real-world problem solving, teamwork, communication, and creative thinking. Through carefully designed, open-ended design problems, many of which are real-world projects sponsored by multinational companies, students learn how to approach design problems in a systematic way and how to use the engineering knowledge and skills acquired from various courses to tackle engineering problems. A full project report and a formal oral presentation are required. In addition, students are exposed to topics related to professionalism, ethics, entrepreneurship, environmental sustainability, etc.

While the Introduction to Engineering and Capstone Design courses share many common features, they have a major difference. The Introduction to Engineering course encourages students to solve design problems based on their intuition and common sense. On the other hand, the Capstone Design course requires students to solve design problems with advanced mathematical and engineering tools. Each semester, JI organizes a Design Expo, where students from the above two courses, as well as other courses that involve hands-on design projects, make poster presentations, demonstrate their prototypes, and compete for design awards.

The Honor Code

The UM-SJTU Joint Institute's Honor Code is one of its distinguishing features among educational institutions in China. Originally inspired by UM's Honor Code, it has been adapted to the local situation at the JI, with the most obvious differences occurring in the implementation and sanctions.

There are two main institutions tasked with maintaining, implementing and developing the Honor Code and related policies. The first is the Honor Council (HC). It is mainly composed of undergraduate students of all grades, from freshmen to seniors. In addition, the two staff student counselors are permanent members. The student members are appointed each year for a one-year term. The second is the Faculty Commission on Discipline (FCD), which consists of three faculty members.

The HC handles reports and investigation

of Honor Code violations and makes decisions on the guilt or innocence of the accused. The FCD decides on the sanctions imposed on students found guilty by the HC. In many cases these are standardized (e.g., reduction of course grade, imposition of extra credits), but they may be adjusted for severity of the violation. Students as well as faculty can appeal decisions they do not agree with. The HC's findings can be appealed to the FCD, which may return a case to the HC for further consideration, and the FCD's decisions may be appealed to the APG.

Student surveys show that the overwhelming majority of JI students is proud of the Honor Code and supports it fully. It is seen as an asset of the JI, a real positive feature distinguishing the JI both from other institutions within SJTU and at other Chinese universities. The number of Honor Code violations in recent years has steadily decreased and we are seeing indications that this number is approaching levels also seen at the UM. The introduction of the Honor Code has enhanced the reputation of the JI while also teaching JI students about academic integrity.

Graduate Education

While the undergraduate program focuses on developing knowledge and skills through class and laboratory work, graduate education puts increased emphasis on developing students' independent research abilities. During the Master's program of studies, students must still take a substantial number of courses, whereas original research is the central focus of the doctoral program.

During their graduate program, students will become involved in research projects, working under the guidance of a professor. Typically, research projects are financed by industry, foundations, or government sponsoring agencies external to the Joint Institute. As many students find it difficult to select an advisor and a research topic at the onset of their graduate studies, the JI offers every entering graduate student a teaching assistant position. If the student takes this position, he/she will have until the end of the fall semester to make a decision. This policy helps smooth the transition from a course oriented undergraduate program to research oriented graduate program.

Degree Programs and Curriculum Design

The JI offers two graduate programs leading to Master of Science (MS) and Ph.D. degrees in Engineering: ECE and ME.

To obtain a MS degree, a student needs to take at least 21 approved graduate-level credits in engineering, math, and science plus 3 credits of technical communication, and achieve a Grade Point Average (GPA) of 3.1 or above. In addition, the student needs to complete and successfully defend a Master's Thesis.

For the Ph.D. program, the requirements depend on whether a student enters the program with a Bachelor's or a Master's degree. For students entering with a Bachelor's degree, at least 39 approved graduate-level credits in engineering, math, and science are needed, plus 3 credits of technical communication. The GPA for these courses must be at least 3.3. For students entering with a Master's degree, at least 18 approved graduate-level credits in engineering, math, and science are required, plus 3 credits of technical communication. The GPA requirement is the same. In addition to the course work, all students will need to pass the doctoral thesis proposal and the candidacy exam, and write and successfully defend a doctoral thesis.

Courses

JI models its program curricula after the ME and EECS departments of the UM. All graduate courses are taught in English by JI faculty members. The faculty is now 20 members strong. The faculty is organized into discipline groups. In mechanical engineering, these are Design and Manufacturing, Dynamics and Vibrations, Fluid Mechanics and Thermal Sciences, Solid Mechanics, Structures, and Materials, and Mechatronics and Control. For

Electrical Engineering and Computer Science, the discipline groups are Computer Architecture and Engineering, Electromagnetism, Optics, and Photonics, Circuits and Devices, Communications and Networking, Signal Processing. Finally, the Mathematics and Numerical Methods group supports the entire program.

Each discipline group teaches one or two core graduate courses that serve as gateway courses into the specific disciple. A number of elective courses, offered with an appropriate frequency, are also taught by each disciple group in support of their research efforts.

Research

In parallel with the teaching efforts, JI faculty members are actively involved in cutting-edge research projects. Research areas associated with mechanical engineering include biomedical technology, energy and power systems, mechatronics and control, thermodynamics and fluid dynamics, dynamics and vibrations, and design and manufacturing. Research areas associated with electrical and computer engineering include communication and networking, microwave, control, electric vehicles, micro/nanotechnology, photonics, biomedical imaging, etc. All JI faculty members receive start-up funding when they join the JI.

Many JI faculty members have secured funding from several Chinese sponsoring agencies including, NSFC Non-Solicited Research Funding, NSFC Youth Funding, 973 subprojects, National Key Lab Funding, Scholar/Talent Programs, and Shanghai Government Funding. In the future, the goal is to apply for larger grants such as those provided by 973 and 863 programs, National Key Research Projects in Specialized Areas, and NSFC Key Project Funding.

Several faculty members also actively participate in the UM-SJTU Research Collaboration Program. This program provides funding for both UM and SJTU researchers to work on collaborative research topics.

Many JI faculty members are also actively seeking collaborative research projects with industry. Many of these companies are US companies with a strong presence in China. The JI program is particularly attractive to them because they feel familiar with its structure and goals, value students with good command of English, and feel "at home" with the overall business and research orientations of the JI.

Graduate Research Seminar Series

Both undergraduate and graduate students lack experience in speaking in front of an audience to present their ongoing research. This dearth of experience is compounded by the notoriously introverted nature of many engineering students who are afraid of speaking even in front of friendly audiences. Yet, the ability of presenting research ideas and results is one of the most important skills students should acquire as part of their graduate education program.

Over their lifetime, all engineers will have to make numerous presentations that will have a profound impact on their careers and promotion opportunities. Employers in both public and private sectors value engineers that excel technically but are also able to present and defend their ideas in public. In fact, innovative and creative individuals are not necessarily those who have the best and most original ideas, but rather those who have the skills to present their ideas and articulate their vision in the most compelling manner.

The goals of the Graduate Research Seminar Series are as follows. 1) Develop presentation skills of graduate students to enable them to become more confident speakers in English with a polished presentation style. 2) Train graduate students to present their work in an environment similar to that found at national and international conferences. 3) Provide systematic and constructive feedback to graduate students about the progress of their presentation skills throughout their program of study. 4) Expose undergraduate students to the research

topics that are addressed at their institution. Because the JI does not separate the Mechanical and Electrical engineering disciplines, this implies that undergraduate students will be exposed to a broad, multidisciplinary set of topics.

Graduate Teaching Assistantship Program

Performing the duties of a graduate teaching assistant has intrinsic educational value. As teaching assistants, graduate students learn to "think on their feet," to answer sometimes simple, but sometimes difficult questions from undergraduate students learning basic material, and to articulate in simple terms many of the basic concepts of engineering. Furthermore, teaching assistants also develop their leadership and public speech skills. Consequently, the JI requires all graduate students be graduate teaching assistants for one semester during their program of graduate studies.

International programs

JI's international programs include both degreed and non-degreed programs. The degreed programs include the DD program and the BS/MS program. The non-degreed programs include the summer and winter international exchange programs with the UM and Technical University of Berlin, Germany. Following sections describe the details of these programs as well as the future vision of JI's international programs.

Dual Degree Program

JI's DD program offers students the opportunity of obtaining two BS degrees in two different majors, one from UM and one from SJTU. In addition, students obtain a certificate from the JI as a proof of their completion of the JI's undergraduate program. This certificate includes seals of both parent universities and names of all members of the Board of Directors, and is signed by the Dean.

DD students study at the JI for the first two years, majoring in either ME or ECE. Then they transfer to the UM and spend the next two years studying in one of the 15 academic programs in the CoE. While they are taking courses required by their major at the UM, they also take some courses required by their program at the JI. In addition, they need to come back to take courses at the JI in the summer after their first year at the UM and after they have completed their degree requirements at the UM, which is required in order for them to finish their degree requirements at the JI in 4 years.

DD students prepare and submit their applications for transfer to any of the 15 academic programs offered by UM CoE during the fall semester of their second year at the JI. These application materials are then forwarded to the UM in January of the following year for UM's evaluation. Admission criteria include GPA of the first three semesters at the JI and proof of English proficiency (TOEFL, IELTS, or MELAB). Each department at the UM sets its own requirement on GPA. Only students who meet a department's specific requirements will be admitted. For consideration of the student body diversity, UM sets a cap of 100 students per year for the DD program. Department-specific admission caps also apply. The information is provided to the JI by November of every year, so that students can plan their program and make decisions accordingly. It should be noted that there is no distinction between students from the JI and students from other institutions as far as transfer eligibility is concerned. However, the application process for JI students is considerably streamlined with the regular application fee waived.

In 2011, 75 students were enrolled for the DD program, 43.9% of the total student enrollment. The DD program has been the most popular international program offered by the JI. Many students come to the JI because of this program, some giving up their admissions to Tshinghua University and Beijing University.

UM-JI Combined BS/MS Program

The combined BS/MS program between the UM and JI is an accelerated program that allows students in the program to complete both a BS degree and an MS degree in 5 years. Students in the program spend the first 4 years at the JI, completing their BS degree either in ME or ECE. Then they transfer to the UM for a year of graduate study in the same or a closely related major and obtain their MS degree at the end of the 5th year. This accelerated program is possible because it allows for up to 6 graduate-level credits to be double counted towards the BS and MS degrees in a manner identical to the same program the UM offers to its students. Graduate-level credits at the JI are credits earned from 500-level courses and some approved 400-level courses.

Admission to the combined BS/MS program is automatic if a JI student is accepted into UM's graduate school. UM does not impose admission caps for this program. Admission decision to the graduate school is made by each department, which is based mainly on the student's GPA and TOEFL score. GRE is waived.

International Exchange Programs

The JI currently has three international exchange programs. First is the Summer Program with the UM. Each year approximately 20 to 40 some UM engineering students come to the JI during the summer (May to August) to take courses side-by-side with the JI students. Since the curricula at the JI are essentially the same as those at the UM, the credits UM students earn in Shanghai can be easily transferred to the UM and counted toward their degree requirements. In addition to taking courses, UM students also learn basic Chinese, visit cultural sites, form buddies with JI students, and/or take on intern positions in multi-national or local companies while in Shanghai.

The second program is the Winter Program in Ann Arbor, which is hosted by the UM. It is a 4-week program typically starts in early January and ends in early February before the Chinese New Year. It focuses on cultural enrichment and English learning. Other than the lectures on English and American culture, visits to local museums and companies as well as excursions are arranged. Each year there are 20 to 30 some JI students participating in this program. The main purpose of this program is to provide students who do not participate in the DD program with some international experience.

The third program is the Winter Program hosted by the Technical University of Berlin in Germany. It is a 5-week program, which starts in late December and ends in early February. It focuses on cultural enrichment and learning of the German language. The enrollment of this program each year is similar to that for the Winter Program in Ann Arbor.

Future Vision

The ultimate goal of the JI is to establish a truly internationalized research and education institute, where students and researchers from around the world come together to learn knowledge and skills and explore the unknown territories in science and engineering, and to train future global leaders with global visions and innovative minds. To reach this goal, rigorous international programs are a must. The JI plans to significantly expand its international exchange programs and recruit significantly more degree-seeking international students in the coming years to provide its students with more international experience.

To expand the international exchange programs, the JI plans to form partnerships with leading universities around the world, especially those top universities with outstanding engineering programs in the U.S. Through these programs, JI students can choose to spend a semester or two in a partner university. They can take courses there and have them transferred back to the JI to meet their degree requirements. In the mean time, an equal number

of students from the partner university will come to study at the JI. No tuition payments will be exchanged. Each student pays tuition to his/her own home university. The benefits these programs provide are obvious. First, these programs provide participating students with valuable learning experience in a foreign university. Second, the international students from partner universities will study side-by-side with JI students, which provides JI students in Shanghai with the opportunity of interacting with international students. Talks with multiple potential partner universities are underway.

In addition to the international exchange programs, the JI also plans to significantly increase its effort in recruiting degree-seeking international students. The goal is to gradually raise the population of international students at the JI from the current level of approximately 3% to more than 20% in 5 years. More international students will help create a more international learning environment, which is important for JI to reach its goal. Considering the fact that JI students are extremely competitive academically, we need to recruit only top-notch international students because otherwise these students will not be able to survive in our rigorous and competitive programs. On the other hand, the JI as a young institute in China may not yet have the name to attract top-quality international students, especially from the developed countries. This dilemma poses a tremendous challenge to our recruiting effort. Hopefully the rapid development of the JI and ascending of its reputation will gradually overcome the difficulties.

Placement of Graduates

The JI has two classes of graduates so far, Class 2010 and Class 2011. According to JI's statistics, all graduates have either enrolled into graduate schools or found jobs, except 7 students from Class 2011, who plan to apply for graduate schools in 2012.

The majority of JI's graduates successfully enrolled into graduate schools in the U.S., China, and other countries. Among the 160 graduates of 2010, 110 students or 68.8% of the total entered into graduate schools in the U.S., 16 students or 10.0% of the total entered into graduate schools in China including Hong Kong, and 3 students or 1.9% of the total enrolled into graduate schools in other countries (UK and France). Among the students who enrolled into graduate schools in the U.S., 90 students or 56.6% of the whole class were accepted by top 10 engineering schools in the U.S. In 2011, the class size was larger and a total of 276 students graduated. Among them, 190 students or 68.8% of the total went to the U.S. for graduate study, 119 students or 43.1% of the whole class were admitted by top 10 engineering schools in the U.S. In addition, there were 26 students or 9.4% of the total enrolled into graduate schools of top universities in China including Hong Kong. There were also 11 students or 4.0% of the total entered into graduate schools in other countries (Europe, Canada, and Singapore). The total number of admissions by top engineering schools in the U.S. JI students received in 2010 and 2011 are shown in Tables 3 and 4. The above statistics show that the quality of JI's undergraduate programs has been well recognized by top universities in the U.S., China, and other countries.

Among the graduates of 2010, 31 students chose to work, while in 2011, 42 graduates went into the job market. All of them have found satisfactory employment positions. The distributions of JI graduates in different business sectors are shown in Figure 1. Some graduates went to work for reputable IT companies such as Intel and Alibaba in research and technical support. Others were employed by leading manufacturing companies such as Shanghai Volkswagen, PSA Peugeot Citroen research center, Schlumberger, GE, Ingersoll-Rand, and the State Nuclear Power Engineering Company as designers, quality control engineers, field support engineers, and sales engineers. Still others found positions in top consulting firms

such as Roland Berger as well as the four major accounting firms: Price Waterhouse Coopers (PwC), Deloitte, KPMG, and Ernst & Young (EY). Moreover, one student started his own business after graduation and has grown it to a size of 20 employees.

The average starting salary of JI graduates in 2010 was 35% higher than that of their SJTU counterparts (the 2011 data is not yet available). Students' solid engineering knowledge, professional skills, and English proficiency have been widely recognized by employers in multi-national companies, state-owned enterprises, and local companies. Although the number of graduates who went to work only counts for less than 20% of the total number of graduates, JI students have attracted interests of potential employers because of their high competitiveness in the job market.

JI's success in graduate placement stems from various career planning and guidance programs it offers to its students. For example, it has a staff member dedicated to school-enterprise cooperation and career guidance. It provides individual consultation on the preparation of resume and interview and the exploration of career interest. It also provides team counseling, which encourages students to share their interview experiences and participate in team building for psychological support. To connect students with potential employers, JI regularly invites managers from top multinational companies to campus to introduce to students employment opportunities and to interact with students on employment related topics. JI also organizes students for various company visits. In addition, JI invites external instructors to campus to teach a special 18-hour course called "Career Guidance", which discusses career interests, personality, values, time management, and interpersonal communication.

Conclusion

With a curricula modeled after the UM and a mission to provide world-class engineering education in China, JI's education program has grown from scratch to a size of over 1,000 undergraduate and graduate students, a full range of degree programs including BS, MS, Ph.D., as well as joint degree programs with the UM, and a number of international exchange programs in a short 5 years. JI's education model emphasizes communication skills, teamwork, creativity, and real-world problem solving, in addition to a solid engineering foundation. These skills are widely recognized as critical to building a successful engineering career. The graduate placement outcomes of classes 2010 and 2011 demonstrate that JI's education model is well recognized by top international universities and well-established multinational companies. As JI's pioneering experience attracts increasingly more attention among China's higher education community, it will be interesting to see how JI's education model will shape the future of engineering education in China.

Faculty Expectations, Profile, and Tenure and Promotion System at the University of Michigan-Shanghai Jiao Tong University Joint Institute

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The mission of the University of Michigan-Shanghai Jiao Tong University Joint Institute (JI) encompasses undergraduate programs and graduate programs with research, with both programs operating in the style of US research universities. Its long-term goal is to be comparable the top-20 US research universities in academic and research excellence. The expectations of the faculty are therefore similar to those in this benchmark peer group. Particularly for junior faculty members, these expectations differ from what is traditionally expected in Chinese universities. In addition, JI has adopted a tenure system that is rare in China. The faculty compensation is notably different than typical compensation in China, both in terms of base salary and supplemental income from research. This article explores JI handling of these issues and related ones, highlighting the distinctions with common practice in China.

Faculty Organization

JI offers BS, MS, and PhD programs and conducts research in Mechanical and Electric-al/Computer Engineering. JI expects to hire about 45 faculty members to complete these two programs. JI does not have any departmental structures that divide the faculty members between the two disciplines it covers. Instead, JI operates as a unified faculty, much like a US college of engineering without departments or department heads. This organization is reflected in the committee structures and faculty governance: JI has one graduate committee, one undergraduate committee, and all hiring and tenure decisions are made with the collective input of all faculty independent of the discipline of the candidate. All faculty are collocated in a single building with no segregation based on discipline.

This administrative and physical organization promotes interaction, research cooperation across disciplines, and beneficial mixing of students in classes like capstone design. Departmental structures can impede that. JI plans to maintain its current organization as it grows.

JI uses the academic ranks of Assistant Professor, Associate Professor, and Professor and adopts the concept of tenure as used in the US academic system. While Assistant Professor never carries the benefit of tenure, Associate Professors and even in unusual circumstances Professors can be untenured. The review process to gain tenure or promotion in academic rank are discussed below.

Faculty Hiring

All faculty members are selected based on potential for or previously demonstrated independent research leadership in their field.

JI has demonstrated its ability to attract extremely strong candidates trained at elite universities. Several JI faculty have received major government awards, including five recipients of the central government's 1000 People Plan award. JI faculty clearly express that they chose JI over other options (including higher rank appointments at prestigious Chinese universities) because JI gives them the research independence of a US university. JI's ability to attract high quality faculty depends greatly on offering them an academic environment where they can independently pursue their own cutting edge research. In fact, JI was founded

largely to cultivate such a setting within SJTU because it is difficult to create it with-in SJTU's existing organization.

The pool of applicants is from around the world with most of the primary applicants educated or currently working at leading US universities. There is no geographical restriction, however. JI searches around the world for candidates that have proven themselves as leading researchers or been trained in labs at the forefront of their field. JI typically receives 400-500 faculty applications per year.

The hiring considerations are the same as those at major US universities. Faculty candidates must demonstrate the ability and ambition to build an independent research pro-gram with the objectives to publish their work in leading academic journals, attract funding to sustain an active lab, participate actively in professional societies, conference organization, and journal editing, mentor PhD students, and compete successfully for national and international awards. JI has perhaps less focus on research funding other than what is needed to build a lab because it currently receives no funding from indirect or overhead costs on research grants.

The hiring review involves comprehensive evaluation of the educational background, publication record, motivation, reference letters, and on-campus interview. An internal search committee guides the process, but the discussion whether to extend an offer involves the entire JI faculty. JI's Academic Program Group, an advisory board to the Dean with three representative from each of JI and the University of Michigan, advises on all hires, especially senior faculty member hires.

Given the standard of faculty we hire, institutional support for JI faculty must be com-parable to that of our competition, which includes the top universities worldwide. This includes startup funding, access to equipment, access to strong PhD students, reasonable teaching loads, and quality lab space.

Lab space collected in a common building is essential to the JI as an institution. JI faculty labs must be close to each other and to the faculty offices to promote research interaction between faculty and PhD students, between different JI labs, and among PhD students. Corporate, academic, and government visitors to the JI must see and appreciate the size, quality, and scope of the JI research by visiting a single facility.

What does JI Expect of its Faculty?

Research

JI expects all faculty members to independently demonstrate research accomplishment within their field. Each faculty member must build their own research record showing their emergence as a visible leader in the worldwide academic community.

The ranks of Assistant Professor, Associate Professor, and Professor designate stages of research accomplishment. At JI, these ranks do not imply a hierarchy where junior faculty work underneath senior faculty. Assistant Professors can lead teams where they have unique strength, and those teams may involve senior staff. All JI faculty are expected to pur-sue their own research directions independent of rank.

The freedom at JI to choose collaborations independently, or to choose not to collaborate, is unusual within China. Faculty members in China are typically assigned to research groups (called institutes) within the university. They are expected to work as a team member within the institute, which usually has a hierarchical structure led by a few senior professors. It is difficult to grow out of this structure and establish a separate research group, resulting in an imposed collaboration with limited opportunity to pursue research directions not aligned with the institute. In contrast, for promotion and tenure advancement, JI expects faculty to show their independent research capacity, and this should be evident even if the faculty member collaborates actively with others.

In fact, JI would avoid hiring candidates that would accept an arrangement working primarily as a team member for another faculty. The junior faculty we seek do not want to be assigned to a team led by a senior person. The senior faculty we seek do not want un-known junior faculty assigned to them. JI faculty will thrive when given the freedom to find collabo-

rators they choose. Research team building and collaboration are strongly encouraged as long as the cooperation is formed among equal partners with all participating faculty contributing their creative intellectual energy.

To allow independent research growth among junior faculty members, JI assistant professors are expected to advise PhD students, and they have this privilege from their first day. This is distinctly different from Chinese academics where faculty members below the rank of Professor cannot advise PhD students. Even after achieving the rank of Professor they must competitively apply for the privilege.

Research funding is not a measure of academic impact or of research quality. It is not a primary measure to evaluate JI faculty members' research. JI focuses on faculty research reputation, visibility, and impact. These are established by working in important areas, strong publications in leading journals, recognition of the research by peers, and professional service in the academic community. Funding assists these goals. It does not indicate or attract international recognition on its own.

In contrast, in engineering fields in China research funding is often the primary measure of research productivity. The focus is on attracting the financial resources with less attention on what is accomplished with the funding. This arrangement measures the input rather than the output. Such an arrangement shares features with the US system where re-search funding is also a key performance measure. In the US system, however, that is driven by the reliance on indirect (overhead) costs from research funding to fund operations. In China, units do not derive significant funding from indirect costs. The associated problem is that units are encouraged to build research capacity, which requires funding for space and facilities, yet they do not recover the costs through return of indirect costs.

Teaching

Teaching quality is highly valued and an important faculty member expectation at JI for academic and practical reasons. JI was established to pursue a new model in undergraduate education that follows a US curriculum taught in English. This includes development of students' abilities in open-ended problem solving, creativity, design, teamwork, leader-ship, and communication. Students pay a tuition premium for this environment. JI's funding is primarily through undergraduate student tuition, and serving the needs of the undergraduate students through teaching excellence is critical.

Faculty members nominally teach three classes split between JI's two 15-week semesters. Each class is typically four or three credit hours. Student evaluations are collected for each class. JI is currently implementing additional procedures to assess teaching and to pro-vide feedback to instructors to improve teaching.

Professional Service

Faculty members, especially at the Associate Professor and Professor ranks, are expected to serve their professional community through journal editing, conference organization, committee membership, serving on panels, and the like. For junior faculty, professional service is encouraged to become visible in the research community.

Faculty Compensation System

JI uses a faculty compensation system like that at US research universities. Faculty members receive a 9-month salary, although this is distributed over 12 months. They can supplement this salary with another three months of salary from research funds, giving a 12-month salary. This is the upper limit of university income. The arrangement promotes faculty participation in sponsored research, yet it caps the income to prevent excessive faculty member focus on obtaining sponsored projects for personal income.

JI faculty member base salaries are high by Chinese standards, of comparable order but slightly lower than US engineering faculty norms. This is necessary for several reasons. JI competes with strong US universities and multinational companies for the high level, foreign-trained, English-speaking faculty members we recruit, and salaries must be competitive. In

addition, unlike Chinese university compensation, JI faculty cannot receive unlimited compensation from sponsored projects. Finally, the teaching demands are higher and faculty members must be capable of teaching in English.

The normal arrangement at Chinese universities is different. Those faculty members usually receive a low base salary that also has low demands for teaching. Faculty members can supplement this income by personal income from research projects, especially industry sponsored projects. Usually up to 20% of the sponsored project funding can be paid to the faculty member as salary with no upper bound (e.g., no 3-month annual limit as in the JI compensation system). In this arrangement, there is strong motivation to pursue industry projects even if they have little academic research content. This tends to proliferate projects that do not support the research mission of the institution but increase the funding statistics that are important for ranking and quality measures in China.

Tenure and Promotion System

The JI's tenure and promotion system closely follows that of US universities. Tenure is viewed as a permanent employment commitment from JI, barring serious failure to perform or acts of negligence, dishonesty, and the like. To gain tenure, JI faculty must perform in all aspects of faculty expectations, including research, teaching, and service. In research they must publish independently, be visible within their field, show evidence their work is being used by others, mentor PhD students, attract funding as a Principal Investigator, and establish their reputation among leading academics worldwide.

Tenure is separate from academic rank. Faculty members may hold the rank of Associate Professor or, in rare circumstances, Professor without having received tenure. Tenure might be granted at the time of hire if prior experience justifies. Tenure is nominally awarded after six years as an untenured faculty member, but this can be accelerated for those entering with relevant research experience. Faculty members can be reviewed for tenure only once, and this review must take place within the first six years as an untenured faculty member unless an extension is granted for special circumstances. If a faculty member's tenure case is denied, they must leave the JI tenure track within one year.

The review process for tenure and for promotion in academic rank of already tenured faculty members is comprehensive. The candidate prepares documentation of all their relevant academic activities according to a formal template, which at JI is the same as what is used at UM. A committee selected by the Dean assembles additional material related to the faculty member's teaching record (e.g., student evaluations, student letters, and other documentation).

The committee also selects external experts from the worldwide (not Chinese) academic community that are appropriate to evaluate the faculty member's research contribution and impact. At minimum five external evaluations are obtained from people with no apparent bias as research collaborators, former PhD/postdoc advisers, and so on. Eight or more independent evaluations are desired. These letters are crucial. The evaluators know that their letters will not be provided to the faculty member so they can candidly assess the research, research impact, use of research by others in the field, visibility of the faculty member, and likely future research accomplishment of the person.

The completed package is distributed, discussed, and voted on at multiple levels of re-view. The first is within the committee mentioned above, which prepares full evaluations of performance in teaching, research, and service. Next, all JI faculty members at the rank being sought or higher meet for open discussion and a subsequent anonymous vote. The JI Academic Program Group that includes senior faculty members at JI and UM then discusses and votes on the case. The Dean includes a final letter of evaluation. The final package including the preceding vote results are submitted to the JI Board of Directors. Their vote is final.

It is essential to provide early feedback prior to the major reviews for tenure or

pro-motion in academic rank. All untenured JI faculty undergo a 3rd Year Review after three years as a faculty member. This review is similar to a full tenure and promotion review except that no external evaluation letters are obtained and the review stops at the JI Dean. The purpose is to identify early any areas where the faculty member must improve in order to successfully complete the later tenure review. In addition, all JI faculty members, tenured and untenured, have a face-to-face annual review with the Dean or Executive Dean.

Conclusion

The organization, hiring, expectations, academic independence, compensation system, and tenure system at JI mimic closely what exists at major US research universities. This has proved beneficial in successfully recruiting excellent faculty members that have competing offers from US (usually) institutions or senior appointments at major Chinese universities. The feature that is especially important in recruiting JI faculty is the freedom and independence of faculty members, particularly junior faculty members, to pursue their own re-search directions and build their own labs. JI faculty also appreciate the expectation that they should be prominent in the worldwide research community and that they will be sup-ported to do so, and that their evaluation is based on research impact more than research funding. Finally, access to the exceptional student talent at JI draws faculty to JI.

Without question, JI's ultimate success in its ambition to become a major research institute known internationally will depend on its ability to attract and support quality faculty members. Based on the prior records and performance to date of JI faculty, the outlook is extremely promising that JI will assemble a faculty capable of performing at the standard of a top-20 US university.