Information Form for SJTU Graduate Profession Courses

<table>
<tr><th colspan="6">Basic Information</th></tr>
<tr><td rowspan="2">* Course Name</td><td colspan="5">Chinese</td></tr>
<tr><td colspan="5">English Modern Laser manufacturing technology</td></tr>
<tr><td>* Credits</td><td>2</td><td>* Teaching Hours</td><td colspan="3">32 1 =16</td></tr>
<tr><td>* Semester</td><td>Spring</td><td>* Cross-semester?</td><td>No</td><td colspan="2">Spanning over Semesters</td></tr>
<tr><td>* Course Type</td><td>Program Frontier Course</td><td>* Course Type</td><td colspan="3">For full-time students</td></tr>
<tr><td>* Course Category</td><td>Specialized Course</td><td>Targeting Students</td><td colspan="3">Master Level</td></tr>
<tr><td>* Instruction Language</td><td>Chinese</td><td>Teaching Method</td><td colspan="3">In class teaching</td></tr>
<tr><td>* Grade</td><td>Letter grading</td><td>Exam Method</td><td colspan="3">Essay</td></tr>
<tr><td>* School</td><td colspan="5">School of Materials Science and Engineering</td></tr>
<tr><td>Subject</td><td colspan="5"></td></tr>
<tr><td rowspan="2">Person in charge</td><td>Name</td><td>ID</td><td>School</td><td colspan="2">E-mail</td></tr>
<tr><td>HUANG Jian</td><td></td><td>School of Materials Science and Engineering</td><td colspan="2">jhuang@sjtu.edu.cn</td></tr>
<tr><th colspan="6">Extended Information</th></tr>
<tr><td>* ( ) Course Description</td><td colspan="5">3D
/</td></tr>
<tr><td>* English Course Description</td><td colspan="5">Laser manufacturing technology is one of the hot technologies nowadays. Due to its advancement, high efficiency and intelligentization, it has been considered as an advanced manufacturing technology with the highest development potential in the manufacturing industry in the current century, and been widely applied in industries. This course introduces the physical base of laser generating, the interactions between laser and materials, operation principles of lasers and laser manufacturing system, and the main laser manufacturing technologies such as laser welding, laser hardening, laser cladding, laser shocking, laser 3D printing, laser cutting and laser drilling, including principles, processing bases and current development. Furthermore, laser manufacturing process features of typical materials and application cases as well as laser safety and protection have been also introduced. Through laser welding and laser surfacing
operate such kind of equipment, and gather practical experiences. Finally, through the course the students can initially grasp the advanced laser manufacturing methods in field of materials processing, broaden their vision, and improve their adaptability in the future career. Students should occupy the knowledge of materials processing principles as pre-knowledge.</td></tr>
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* ( ) Syllabus	

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* English Syllabus	

Chapters	Content	Class hours	Teaching approach
Ch. 1	Physical base of laser manufacturing	6	Lectures
Ch.2	Equipment system for laser manufacturing	2	Lectures
Ch. 3	Laser welding technology	6	Lectures
Ch. 4	Laser additive manufacturing (Laser3D printing)	3	Lectures
Ch. 5	Laser cladding and alloying	4	Lectures
Ch. 6	Laser surface hardening	2	Lectures
Ch. 7	Laser shock peening	2	Lectures
Ch. 8	Laser cutting and drilling	2	Lectures
Ch. 9	Other laser manufacturing technologies	2	Lectures
Ch. 10	Safety protection for laser manufacturing	1	Lectures
Experiments	Laser welding; laser hardening or cladding	2	Experiments

* Requirements	25% 75%
* English Requirements	The course assessment consists of two parts: Class Participation and Final Project. The class participation includes assignments, experiment reports and attendance, 25% of the total score. The final project is a literature review report, 75% of the total score.
* Resources	1 ISBN: 9787118109849 2016 2 / / (2) ISBN: 712225609X, 9787122256096 2016 3 2011
* English Resources	1) Laser Manufacturing and its Applications, YU Gang, et al, ISBN: 9787118109849, in Chinese, National Defense Industry Press , 2016 2) Laser Welding, Cutting and Cladding Technologies, LI Yajiang, et al, ISBN: 9787122256096, in Chinese, Chemical Industry Press, 2016 3) Advanced Laser Manufacturing Technology, ZHANG Yongkang, et al, ISBN: 9787811303001, in Chinese, Jiangsu University Press, 2011
Note	